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"TOMORROW'S PHYSICIAN : TODAY"

12TH — 17TH JULY, 1986

KOTA BHARU, KELANTAN, MALAYSIA

EDITOR :
MOHD. ROSLANI ABDUL MAJID

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PULAU PINANG
1987

FOREWORD

This conference, which was to commemorate the first graduating class of doctors, brought together medical educationists who have, in some form or other, wanted to bring about changes in the existing medical programmes. This is evident in the papers that were presented. Many papers from our School were presented to represent our attempt to meet the needs of Tomorrow's Physicians, to learn of experiences of others and thereby consolidate our programmes further.

We have also seen the need for Medical Schools to address their Curriculum to national needs. The address by the Director General, Ministry of Health, Malaysia, provided food for thought applicable to all countries (appropriate modifications accepted). As this subsequently led to a lot of discussions, the topic for the Panel Discussion was modified to allow for wider participation.

We, the Organisers are thankful to all the participants for their contributions. We have published in this Proceedings papers that have been received by the Secretariat. We have, as far as possible, retained the original script.

ASSOC. PROF. (DR.) MOHD. ROSLANI ABDUL MAJID
Chairman Organising Committee.

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MAIN KEYNOTE ADDRESS

MEDICAL EDUCATION: REORIENTATION IN THE CONTEXT OF HEALTH FOR ALL STRATEGY

Address by:
The Director General of Health Malaysia,
Tan Sri Datuk (Dr.) Abdul Khalid bin Sahan
at the International Conference on Medical Education,
Kota Bharu, Kelantan, 12th July, 1986.

In spite of tremendous advances in biomedical sciences and ready availability of effective technologies, in many countries health programmes continue to be uneven in coverage and low in level and quality. In many parts of the world, health services have not reached the rural and urban poor, or the services are grossly inadequate or unreliable. There appears to be imbalance in the allocation of resources between curative and preventive programmes, and as a result, health problems which can be controlled or prevented still persist.

Many factors have contributed towards the current inequity in health care. Lack of political commitment is one, and poor planning is another. Both determine the level, type and distribution of investment for health. Another important factor is the perception of the medical profession with regard to their role in health care. The emphasis appears to be more on "curing" rather than "caring", more on disease rather than health, and more on technologies rather than patients. Modern medicine has definitely improved the prospect for better diagnosis and treatment, but in the process we have unconsciously made the public over-dependent on medicine to stay healthy. Modern medicine has become a service industry and the public are the consumers. We now talk in terms of "market forces" and "ability to pay". The catch phrase "Partners in Health" appears to have lost its significance and relevance as the medical profession, armed with the latest equipment and drugs, moves in to occupy the centre stage, whilst the bewildered patients choose the easy way out and withdraw and surrender the responsibility for their own health to doctors and nurses.

Another significant factor in the equation is the current dominance of medical technologies in practically all health matters. One effect of this is that disciplines and sectors which are relevant to health are not involved in health maintenance or promotion programmes. Another effect is the creation of what some people call "profession-induced demands" which, if complied with, will further aggravate the current imbalances in health care.

This country has shown that a strong political commitment and pragmatic planning can improve health care within a relatively short period. Through the judicious use of resources and the adoption of appropriate strategies, we have been able to provide facilities and implement programmes throughout the country. Health and other indicators show that we have made significant progress. There will still be pockets to be covered, residual problems to handle

or new ones to contend with. We may not have reached the status of more advanced countries. But then, when we first started national development in 1957, we were perhaps fifty years behind them. More meaningful would be a comparison of what we now have with what existed in 1957, to see whether there had been progress. Comparison of current health status of countries at different stages of socio-economic development should be used only to indicate the potential for further improvement rather than to judge the success or otherwise of local national effort.

Since doctors play the dominant role in the current health scene, it is timely that we re-examine and if necessary re-orientate medical education. I would like to congratulate the University of Science, Malaysia for the initiative it has taken in organising this forum. That the youngest medical faculty in the country is spearheading this movement for review and change is significant and a tribute to its faculty members. I hope this and similar forums will provide the basis for continuing dialogue and coordination between those responsible for health programme development and medical education.

Rationally speaking, a review of medical education must involve an analysis of roles and functions of doctors and their teams in the health system. Roles and functions can only be properly examined and fully understood if we take another step backwards to consider the various factors which determine health objectives and strategies and the organisation and structure of health services.

Many factors determine health programme development. The obvious ones are the local health problems, population characteristics, status of overall development, resources available, national development objectives and strategies, and the system of government and economy.

The types and extent of health problems determine the content of health care to be provided and the priority given to each. In most developing countries, health problems are closely linked to poor sanitation and public hygiene, poverty, inadequate food or improper food habits, ignorance and inappropriate customs, beliefs and practices. Preventable or controllable infectious diseases are widely endemic, now and again breaking out into epidemic proportion with high morbidity and mortality. Re-infection is common, whilst those with chronic infections eg. tuberculosis, leprosy and various types of parasitism continue to suffer long, debilitating ill-health. Most developing countries have high birth-rates, and children and mothers constitute special high-risk groups.

The concept of health and disease differ in different communities. In some, minor ill-health is tolerated or not even recognised as disease. For example many diseases of childhood are considered as part of the growing process in many communities, and hence treated lightly unless serious complications arise.

The health problems of developed communities, on the other hand, are more related to the ageing population, self-chosen habits and practices, various types of excesses, man-made pollution, and the stress and strains of modern living. The disease pattern is dominated by gaeriatric problems cancers,

metabolic diseases, accidents, conditions related to alcohol and drug addiction, various types of neurosis, and others associated with urban living. Because they live in a clean environment or are protected by immunisation, children grow up without experiencing the traditional diseases of childhood or those associated with poor public or personal hygiene. The infection occurring in developed communities are usually those for which no preventive measures have been found.

Highly developed communities with their high standard of living and education have a different perception of health and disease. They are more aware of illness and take them more seriously, although they do knowingly take risks. They make greater demand on health services, and expect higher standard of health care.

Although the health problems of developing and developed communities appear to be different, this difference is only in terms of extent. The urban-based population of developing countries do face health problems similar to those of developed countries and many developed countries do have periurban slums and shanty towns. What is actually seen is a spectrum of health problems which changes in type and intensity not only over time but also in space as one moves from one area to another.

Medical education, however, must recognise the dominant local health problems so that the proper emphasis is given in its curriculum. Recognising that health problems will change, it is also incumbent on those responsible for medical education to ensure that medical practitioners can respond quickly and effectively to these changing needs.

There are three demographic factors which are relevant in the planning of health programmes. These are the age structure of the population, population growth trends and population dispersal. The age structure and population growth trends influence the pattern of health problems, whilst population dispersal is relevant in the organisation of health facilities. How population age structure and growth trends influence health problems has been touched upon briefly. In choosing alternative health development strategies, population dispersal is an important variable. In densely populated urban areas, it is possible to provide a comprehensive range of high level services from one or a number of large centres. These centres would be easily accessible to all. But in areas with scattered population, which is the common feature of all rural communities, such a development will neither be feasible nor appropriate. Many countries have adopted the strategy of developing a network of small rural health units providing a hierarchy of services. Most systems would have two to three tiers of such units. The most peripheral would have one to two paramedical or auxiliary staff providing first aid and basic maternal and child health care. The more central units are bigger, have more staff and provide a wider range of services. A doctor is usually stationed at these bigger units, from which he travels and supervises the activities of the more peripheral centres under his care. He is expected to practise primary health care, see cases referred to him, deal with emergencies and provide leadership to his health team. The question is how adequately has he been prepared for this role?

The status of development in a community influences the pattern of health needs and demand, whereas the resources available would determine how those needs and demands would be met. The more developed a community is, the higher is public expectation particularly for high technology, and usually also high cost medicine. Considering that resources are never unlimited, the question invariably is how to provide the most for all, rather the best for a few.

Considering that a substantial proportion of the cost of health care can be attributed to the decision of doctors, their ability to choose the right investigations, procedures, equipment or drugs in terms of cost and effectiveness will contribute to more rational use of resources and help to contain cost. The need to instil cost awareness among doctors has never been greater than now when the medical world is flooded with so-called improved technologies, new models or generations, or new drugs the superiority of which may only be marginal or has yet to be tested fully.

It may not be too much to ask medical students to work out the total cost of investigating and treating patients who come under their care. To be meaningful, such costing should include the cost of drugs, personnel and other overhead cost and the cost to the patient in terms of lost income. If they do this often enough, the message would have been driven home. On graduating they may be less inclined to over-investigate, over-treat or over-prescribe.

It is not possible to describe in detail how the overall national development objectives and strategies influences the organisation and structure of the health services. But certain important features of various health programme models are worth mentioning because they have a bearing on medical education.

These features are:

(a) the relative emphasis between preventive and curative services, and the extent of involvement of non-medical disciplines and sectors in health maintenance and promotion.

(b) the extent to which health programmes and activities are integrated. Integration may be essentially organisational in the sense that services are provided under one roof but by different staff. On the other hand a single worker may perform many functions.

(c) the staffing mix, particularly the extent to which para-medical staff are used. Many developing countries use paramedical and anxiliary personnel extensively as doctor substitutes or doctor assistants. The role of the doctor when he works alone is different from his role when he works as a team leader.

(d) the role doctors are expected to play. In addition to their traditional role in the diagnosis and treatment of diseases, it is increasingly realised that doctors must also be managers, teachers, counsellors and leaders in the community. If they are to perform these functions effectively they must be adequately prepared and appropriately oriented.

(e) institutional versus community-based care. Many programmes now

emphasise community-based care, day care centres, day surgeries and early hospital discharges. This is to minimise long stay in hospitals and to enable patients continue treatment in their homes.

In examining how the system of government, administrative set-up and the type of economy shape the organisation of the health services, the critical issues to be considered are (i) the extent to which the community is involved in making decisions, (ii) accountability of providing agencies, to whom are they responsible, (iii) the degree of subsidisation or cross-subsidisation, and (iv) the role of the private sector and the extent of governmental control over it.

Some may view these as exclusively political issues, remote from the interest of doctors. But Health for ALL is a political objective necessitating politically directed socio-economic changes. Doctors who share this objective must appreciate the aforementioned issues for three reasons: so that (i) they understand better why certain policies are made, (ii) they can be more effectively involved in the overall national development effort, and (iii) they are better able to participate in bringing about those changes.

If it is deemed necessary to orientate medical education to the expected role of doctors in the health care system, it is equally important to ensure that doctors possess the professional competence and appropriate attitude in dealing with individual patients.

The relationship between a patient and his doctor is a social contract. But unlike other contracts, it is unwritten and without specifications, partly because they are assumed understood by both parties and partly because one party, the patient, believes that the other knows best. In reality it is a one-sided relationship in which the doctor, having the advantage of knowledge and skill, lays down all its terms and conditions, whilst the patient, not having similar mastery and over-awed by medical terms that he cannot understand or medical paraphernalia that he has not seen before, merely becomes a passive, unquestioning recepient of service. The doctor, quite naturally will proceed according to his personal and professional bias. Since he is most familiar with the disease model and scientific technologies are considered the basis of his practice, he may cure the disease but fail to treat the patient. At the end of the day the patient may say "I am cured, doctor. But I still do not feel well." What he is implying is that the contract had not been fully executed. In another setting the other party would be accused of breach of contract.

Personally I have not come across any patient who insists on an official, written contract before a doctor treats him. But if I were to draft such a contract, I would lay down the following specifications:

- Prompt personal services
- Minimum cost
- Minumum investigations, procedures and drugs
- A lot of kindness, sympathy and regard for my emotions and spirit
- Use technologies which are efficacious, effective, efficient, acceptable,

safe and appropriate

- Quick and full recovery. I must feel well at the end of it.
- Complete explanations of my illness, treatment and of my part in the relationship
- Due consideration of my family and community
- Advice on recurrence or similar occurence to my family or community
- Confidentiality
- Comprehensive contract as far as possible. In other words minimum sub-contract or referrals.

If these are the expectations of patients in general, the current disease-cure model in medical education and medical practice is obviously out of place. The rise of technology has transformed the patient into an object of observation and measurement and the doctor into a scientist and technologist. Medicine has become a "curing" rather than a "caring" discipline. Some basic changes in medical education is necessary to restore the balance between cure and care.

If I have appeared to be exaggerating, it is only because of the urgent need for the medical profession to re-examine itself and its practice. Such words and phrases as "dehumanising", "depersonalising", "disabling", "inadequately humanistic", "disease model basis" and other similar uncomplementary terms are being used by those within and outside the profession to describe the current trend in medical care. Clearly there is a case for the profession to answer.

The inappropriate training of health personnel has been recognised as one of the most important causes of the weaknesses in many health services. When medical graduates find it hard to adapt themselves to the type of work expected of them, when they are unwilling to be posted to the rural areas or when their education creates a huge communication gap between them, other health workers and the public, one cannot help but join the strident chorus of call for a revamping of medical education to produce a new breed of doctors. When licensed practitioners are unable to deliver the goods or opposes others from doing so on the ground that medical care is too complex or too dangerous to be relegated to less qualified or differently trained people, a credibility gap exists. One is not surprised, then, at the anti-profession or anti-technology stance of many social critics. The resurgence of interest in traditional medicine and the frequent call for a more holistic and humanistic approach towards medical care constitute an oblique criticism of the current system and a tacit expression of disenchantment and disillusion with what it stands for. This erosion of confidence must be rectified if doctors are to continue to play their dominant role in health programmes. The plot of the play is the same, but if the doctor is to continue to be the lead actor, then he must be able to adjust to a new tempo and scenario and perhaps to an expanded cast of other performers.

It will be wrong, however, to put the entire blame for the current deficiencies only on medical education. There are other reasons to explain for these short-

comings. These would include problems of choices and approaches, inadequate resources, the structure of the health services and even technical and managerial weaknesses. If the stage is uneven and the music discordant, one cannot expect much even from the most accomplished dancer.

If Health for All is the goal, doctors must have the competence to practise primary health care in the community. They must be able to meet society's expectations, educate the public, promote self-reliance, work with other professions and sectors, work in under-served areas and for disadvantaged groups and involve themselves actively with community activities. They should be interested and active not only in the curative aspect of medicine but also in disease prevention and health promotion. They should be able to meet the basic health needs of the community and the individual by applying medical knowledge and skill not only scientifically but also with feeling and a high degree of sensitiveness to peoples' values and emotions, and the hidden dimensions of health and disease.

The question is "How well prepared are our new graduates for these roles?" At the risk of incurring the wrath of my respected colleagues in the faculties of medicine, my answer would be "Not very well". To detractors or would-be detractors I must hasten to reiterate that a re-orientation of medical education is not the only change that is needed to make the present health programmes more effective. The objectives, organisation and management of the health care system must facilitate and accommodate the desired practices. These two factors i.e. medical education and health programmes must be compatible and move together in step towards the common goal.

Looking at the problem as it stands now, the desired re-orientation of medical education can only be achieved by reviewing its objectives, structure and process.

In one university the main objectives of the course of medicine are stated to be the acquisition by the student of knowledge of the sciences forming the bases of Medicine, understanding of the scientific methods, and understanding of man in health and disease, and his physical and social environment. Another university states that the aims of the medical undergraduate course should be to ensure that the student is able to use the knowledge of basic and clinical sciences in approaching and solving medical problems. The first university emphasises the acquisition of knowledge, whereas the second rightly focuses on the development of competence to deal with problems. These two examples clearly indicate the difference in approach in medical education.

If I were to re-write the objectives of medical education in general behavioural terms, I would say that at the end of the course, the medical graduate should be able to

- apply effectively techniques to promote health, to prevent disease, and to cure and rehabilitate patients
- deal with the family and community as well as the sick patient
- deal with the local health problems effectively

- work as a member of a health team
- optimise the use of available resources
- work within the local health practices
- have an unbiased understanding of his role in the community, and to play that role effectively
- undertake continuing professional improvement.

These objectives are obviously different from many current ones. They indicate the type and extent of re-orientation that are needed.

If we look at the structure for medical education, the most obvious features that come to mind are the system of institutions used for teaching, the role model played by teachers and lastly the students themselves.

Teaching hospitals, as they are currently used and run, are tertiary institutions. They are organised by departments representing various disciplines and specialities. Although some form of coordinating mechanism may exist, to a large extent they run independently, each department guarding jealously its own turf and with students required to sit departmental examinations. Being tertiary institutions, the bias is naturally towards specialist care. The patients or problems seen are biased samples, and learning experiences are restricted to the acute phase of the health-disease continuum within the hospital setting. This tendency is reinforced by the dominant disease model of medical care and the role models played by teachers. The discipline of public health and preventive medicine is supposed to provide medical students with knowledge and skill in disease prevention and community-based care. But because of the low status often given to this discipline, the lack of its integration into the total educational process and the dominance of clinical teaching, the bias towards hospital-based medicine prevails.

Many enlightened university and faculty administrations have attempted to correct the present weakness by adopting district and other hospitals and even rural health centres as part of their teaching system. Students and some members of the teaching staff are posted to these centres for varying periods of time. But even these sorties into the real world of medical care may fail if teaching continues to be segmented and departmentalised, if there is no total commitment from all concerned, and if the focus on disease in the health-disease continuum persists.

Some medical faculties have established department or chair for primary health care. There are even post-graduate courses in primary health care or so-called family medicine, the arguement being that doctors as they are now trained are not fully equipped for this type of practice. I have yet to be convinced that these are the preferred line of action or all that we need to take to rectify the weaknesses in the existing medical education. For one thing, the mere establishment of a department or chair for primary health care is inadequate to improve the current situation, unless accompanied by basic structural and functional changes in the entire educational system. For another, can we afford the luxury of another few years of post-graduate training in primary health care in addition to the five to six long years of under-

graduate education before the new graduates can become really fully effective in the community? Or the question can be asked in another way: "If they are not trained for primary health care, then for what are they being trained now?"

Not being an "educationist" myself, I can only make general comments or ask a few questions regarding the processes of medical education.

To start with we can look at the curricula. There are very few medical curricula which are competency-based. The majority are subject-centred and implemented departmentally. There are a few attempts at using so-called integrated curricula with varying success. Because learning objectives are not clearly spelt out, there is a tendency to load students with masses of factual information. The learning of principles and their application to the solution of problems are not given adequate emphasis. The imbalance is also seen in the assessment of students. Examinations very often emphasise the ability of students to recall specific facts rather than to apply basic principles in problem solution.

The age-old debate on how much time should be allocated to various subjects will continue so long as there is no rational basis to the medical curricula. The dominance of departmental interest hinders attempt to re-allocate curricular time and non-medical subjects deemed important for community health eg. sociology, anthropology, health economics, political science and studies of the environment may not be given adequate emphasis.

In a five year medical education programme, three years are normally set aside to the study of clinical medicine. If one considers the one year compulsory internship as a continuation of medical education, the total period for the study of clinical medicine is four years. There is increasing concern among medical educationists on how these four long years are spent. Some say too much time is taken up by routine manual tasks or hospital activities at the expense of learning how to deal with problems constructively. Other have questioned the extent of speciality training or speciality electives in relation to the primary objectives of undergraduate medical education. In view of the frequent complaint of lack of time to cover various subjects adequately, it is necessary to decide what should be covered in the undergraduate period and what can be left to later years.

Skills can only be acquired through properly planned practical learning experiences "in a representative range of health problems encountered in their normal setting". The health problems seen in hospitals consist mainly of acute serious illnesses, or illnesses of long standing which have not responded to self-medication or other forms of treatment or which have recurred. The problems encountered are therefore a biased sample. In most cases, the teaching is heavily weighted towards the care of inpatients though teaching hospitals do conduct outpatient sessions. The reasons are obvious. Firstly, it is easier and more convenient to teach on in-patients. One can take one's own time to investigate, treat and observe cases. Secondly, the departmentalised method of teaching demands that patients be classified and managed departmentally. Inpatients represent the highest level of departmentalisation. The

general polyclinics which are the first point of contact in hospitals are usually undifferentiated and of not much interest to specialists. Since only one in ten outpatients will be admitted to hospitals, the learning experiences of undergraduates are that much restricted. Even if undergraduates are posted to these polyclinics, the effectiveness of the exposure is doubtful considering the current inherent bias towards ward and departmentalised teaching.

One particular skill which appears to be lacking among new graduates is the ability to work with other members of the team. The role of other professional and paramedical staff are not fully understood. As a result their potential contributions are not correctly or fully used. The ability to work with other people is critical in primary health care if the total need of the individual or community is to be met. This skill can only be learnt through relevant practical experiences in the field and with appropriate role models.

A lot had been said about relevance in medical education. Very often the question is applied to competence only i.e. knowledge, skills and clinical judgement to handle health problems in a given situation. Doctors trained in a particular setting may be incompetent to deal with the health problems of another, though they may have passed the necessary licensing examinations in which they have obtained their training.

Relevance of medical competence is only one aspect of the concern. Medical education should also be relevant to the local culture and health practice. A mismatch in medical education is costly to both medical graduates and the community.

Since medical and health practice is so much culture and context bound, can there be international standards in medical education? Abrahamson had convincingly argued that international standards truly do not exist. Surprisingly even national standards of medical education are difficult to identify. He quoted the case of the European Economic Community which attempted to remove the barrier for doctors to move among member states through reciprocal registration. Such movement had been small in numbers, because doctors do not like to leave their familiar setting, and because of difficulty in giving reciprocal recognition to medical qualifications.

Some time ago I took part in a forum on the topic "The Made-in-Malaysia Doctor". I suggested then that the topic should have been titled "The Made-for-Malaysia Doctor" to emphasise the importance of relevance in medical education. This is because even locally produced doctors may not be suitable to local needs.

Re-orienting medical education towards primary health care connot be achieved by mere statement of intent or superficial, cosmetic changes. Nor can it be said that re-orienting medical education is all that is needed to implement the primary health care strategy. Both medical education and health programmes must be in tandem because they are interdependent. Medical education for primary health care cannot take place in a vacuum. It needs models and demonstrations of primary health care practice based on methods no less scientific and stringent than that for tertiary medical care. On the other

hand health programmes based on primary health care cannot succeed unless the practitioners are skilled in and committed to the practice of primary health care. In most cases changes are needed in both. Agencies responsible for medical education and health programmes must coordinate their objectives, strategies and activities.

One of the factors which perpetuates disease-centred and technology-biased health care is the system of reward and recognition for various types of medical skills. It appears that doctors involved in health promotion, disease prevention or community-based practice are given less reward or recognition both within and outside the profession. Their contribution seldom catches the public eye nor does it appear in the equation for reward and recognition. This ideological bias, born and bred within the profession has adversely influenced the attitude of the public, medical students and young doctors alike.

One way of encouraging medical faculties to orientate medical curricula to primary health care is to give greater support to community-based research. Through such research health professionals and the public can be convinced that community-based practice is rewarding, and worthwhile results can be attained.

Anyone attempting to change the pattern of medical education is likely to face resistance from many quarters. Medical faculty members would consider such an action as an encroachment on well-established practices and a potential threat to academic autonomy and existing order and structure. They may not be convinced of the need for such changes or may only outwardly accept them.

On first entering the medical faculty, the majority of medical students would give serving the community as one of the main reasons for choosing medicine as a career. But this idealism appears to evaporate as they progress in the medical course and financial consideration becomes more dominant. They are influenced by what they see or do, and the role models adopted by those with whom they deal or come into contact. If general practice or primary health care practice is all that satisfying and rewarding, they may wonder why none of their teachers are general or primary health care practitioners.

I tend to go along with the view that financial consideration is the dominant reason for people engaging in medical practice. The prevailing economic system contributes to the current attitude of the profession. The demand of the more well-off section of the population for high technology, high cost medicine, often encouraged by the profession itself, indirectly influences medical education and the value system of practitioners. The extent of attitudinal changes that is needed to re-orientate medical education is enormous. To bring about those changes would require full conviction, a strong sense of commitment, persistence and innovative approaches. But changes there should be, and succeed we must, because the cost of failure is great.

CURRICULUM DESIGN

CURRICULUM DESIGN

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The purpose of this paper is to set the stage for subsequent presentations about various aspects of the medical education curriculum. The paper will begin with a statement of some basic assumptions about curriculum design; present some definitions of "curriculum"; explore some specific curriculum design strategies and consider briefly some additional factors that influence curriculum design.

ASSUMPTIONS:

Three basic principles or assumptions need to be considered as base for discussions about the curriculum. Although they are quite obvious, it is helpful to state them explicitly, so that we can have a common understanding of **WHY** we are doing what we're doing, in designing a curriculum.

Assumption 1:

The basic purpose of medical education is to produce physicians who will contribute maximally to reducing the burden of illness in our society.

In other words, there must be a link between the documented health problems of a given population, and performance expectations of medical school graduates as embodied in the training programs which produce those graduates.

Assumption 2:

We are in the business of training physicians for the future. (The theme of this conference captures this idea "TOMORROW'S PHYSICIAN: TODAY"). It is not good enough to restrict the contents of the curriculum to those things which we understand today in the recent past. We need to look at Trends, and make projections, and include this analysis in the curriculum of medical education.

Assumption 3:

We must evaluate our efforts in medical education. For example, those of us who design medical education curriculum, can judge our activities by asking 3 simple questions about the curriculum.

- is it **effective** (that is, do the students achieve the stated objectives?)
- is it **efficient** (that is, are the resources, time and facilities used in the most cost-effective way?)
- is it **enjoyable** (is the environment for both students and teaching staff optional for learning?)

DEFINITION OF CURRICULUM:

Two definitions are given below:

Firstly, a curriculum can be thought of as the sum total of the formal arrangements which the faculty put in place, or the curriculum committee to help students achieve stated objectives. These arrangements include components such as the following:

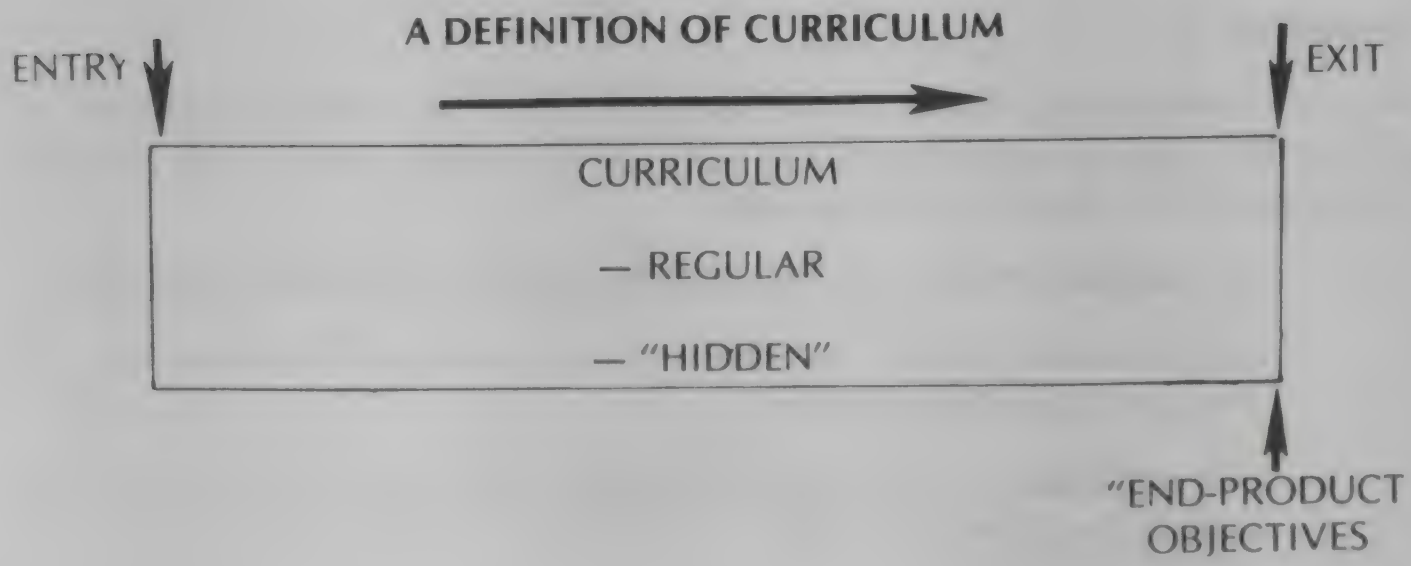
- objectives: stated in various ways, sometimes as a specific competency expectations at the end of medical student training; and sometimes only implicitly, embedded (some would say obscured) in a lecture or a laboratory exercise.
- teaching and learning methods.
- learning resources — including audio-visual resources, computers, libraries and prepared notes.
- settings: including hospitals, out-patient clinics, rural health centres a variety of other settings.
- evaluation system: This must be included in the definition, because as every student knows, the way we evaluate students is a true reflection of what we think is important..

Secondly, the term "curriculum" may be defined as illustrated in Figure I. In this box diagram, we can consider the box as the sum total of the experiences which medical students have, between the point of entry and the point of exit, at which point they hopefully will have achieved the "end-product" objectives. These experiences can be divided into two basic forms: the regular, structured curriculum (as defined above); and a whole variety of experiences sometimes known as "the hidden curriculum". These informed experiences may include interactions with peer, working with role-models (good or bad), or perhaps some experiences which have more to do with becoming a person, than becoming a doctor.

This hidden curriculum may be as important as the regular curriculum, in influencing how physicians may eventually perform.

FIGURE 1:

A DEFINITION OF CURRICULUM



DESIGN STRATEGIES:

Unfortunately, in many medical schools, the design of the curriculum receives little thought or review. In this section, consideration is given to some design strategies for three components of the curriculum: the content, the teaching-learning methods, and the overall structure.

The Content:

How shall we organize the vast amount of information which we think our students should know, or the skills they should master? Various approaches can be considered.

The most common approach is to organize knowledge by discipline or department, usually in the form of a course. And so there are courses in biochemistry, pharmacology and other subjects. In this approach, it is left to the student to integrate the information from different courses, in order to use appropriate information in the analysis and management of patient problems.

An alternate strategy involves the organization of curricular content around systems, usually organ systems. This approach was pioneered about thirty years ago by Case Western Reserve University in Cleveland. Another system follows the life cycle theme, where information and learning experiences are organized around stages in the life cycle: reproduction, growth and development, adolescence, adulthood and aging. The systems approach provides more integration assistance to the student. It does, however, require a climate and structure for inter-disciplinary collaborations.

More recently, several institutions have organized the curriculum around patient problems or cases. This strategy is based on the rationale, that if the goal of medical education is to produce graduates who will be able to manage various patient problems, why not base the curriculum directly on problems. This strategy has come to be called problem-based learning. A major advantage of this approach, is that student learning can be linked directly to the priority health problems in a given region.

However, it is essential that when the content of the curriculum is presented, its structure should be clear to the students, so they can see the various parts of the curriculum fit together.

The Teaching-Learning Methods

Teaching and learning activities can be divided into two basic types: teacher-centered, and student-centered methods.

Teacher-centered methods are controlled primarily by the teacher. Examples are typical lectures, structured laboratories, and consultant ward rounds.

Student-centered methods include small-group tutorials (with a facilitative tutor), student electives, and independent-study opportunities.

The best mix of those two categories needs to be determined by each

institution, depending on local leadership, opportunities and basic educational philosophy. The three criteria mentioned earlier (effectiveness, efficiency and enjoyment) can be used as a guide in determining the most appropriate mix. For example, using the effectiveness criteria, if a key objective is to help students become independent learners, then the teaching-learning methods selected likely will be predominantly student-centered.

The Structure:

There are design considerations that relate to the structure of the curriculum itself. There are several ways to think about curriculum structure, each of which represents a different strategy.

The most common strategy involves presenting to students the normal, before the abnormal. And so we have normal biochemistry before metabolic disorders are considered. This sequence assumption has been challenged by some institutions, with the argument that the normal can be understood best in conjunction with the abnormal. In a problem-structured curriculum, a student may in fact confront the abnormal (the patient's problem) before thinking about what is normal.

Another structural strategy is represented by the sequence of premedical to pre-clinical to clinical education. Again, this sequence is increasingly challenged, with many institutions providing opportunities for having the students work with patients and learn clinical skills early in the curriculum. In this way, students develop a sense of what they will need to learn at some later stage, to solve clinical problems. In addition, only contact with patients is a powerful motivator, and helps students see the relevance of what they are learning.

Again, the selection of an appropriate structure can be facilitated by using the effectiveness/efficiency/enjoyment criteria mentioned earlier.

OTHER DESIGN CONSIDERATIONS:

In addition to the specific strategies used to design a curriculum, there are other factors which influence the way in which the curriculum is designed and implemented. Two of those factors are presented: the administrative management of the institution (Institutional Organization), and the process of renewal (curriculum renewal).

Institutional Organization:

Medical schools are organized in various ways for several purposes. These purposes include research, education, health services, administration and community development. As it relates to the educational mission, the question is whether the medical school's organizational arrangement helps or hinders its undergraduate medical education programme. It must be remembered that the aim of undergraduate medical, education is to produce a general (undifferentiated) product.

In this context three organizational arrangements for curricula are presented.

1. In a **departmental** model, the curriculum arrangement follows a department-based institutional organization. For example, if there is a department of microbiology, this department is responsible for a component of the curriculum, usually in the form of a course.

2. An alternative arrangement is a **programmatic** model, where undergraduate medical education is the responsibility of a programme committee, which is accountable to the institution as a whole (and not to a specific department). This model is based on the assumption that a programme of studies and experiences is designed to help students achieve certain competencies. The programme committee draws on the expertise and manpower of departments or divisions, to implement the curriculum.

3. In fact, some institutions have **mixed** models, where there is a programme (or general) curriculum committee, but parts of the programme are delegated to departments or divisions.

   As a general observation, the departmental model is associated with difficulties in achieving integration, and in introducing significant curriculum innovation. The recently published North American review of medical education, "Physicians for the Twenty-First Century", strongly recommended a move toward programmatic planning and implementation of the curriculum.

Curriculum Renewal:

A critical feature of curriculum design is the process of curriculum renewal. It is not enough to design a programme, and implement it, without some capacity for modification and renewal.

There are many reasons for curriculum renewal, including the following:

- the constantly changing knowledge base in medicine
- new developments in diagnostic and information-handling technology
- changing patterns of health and illness
- institutional stagnation
- leadership turnover
- turnover of teaching staff.

For these and other reasons, it is crucial to have an institutional mechanism for renewal. One device which many institutions have found useful is an annual faculty retreat, sometimes supported by an annual report.

CONCLUSION:

When designing a curriculum, it is important to remember that the curriculum is not the only formal structured arrangements which the teaching staff has established. Nor is it only the sum total of the students' experience, planned or unplanned. A broader view is needed, and the curriculum should be seen as an activity where students and faculty learn and work together.

IMMUNOLOGY: AN ORGAN SYSTEM OR A DISCIPLINE?

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Introduction:

The integration of immunology in curriculum design can be difficult in countries where it does not exist as a clinical entity. This applies to both traditional and integrated curricula. A further problem is the fragmentation of the immune system as an organ system even in an integrated curriculum such as that of the School of Medical Sciences, Penang. There is overwhelming evidence that the immune system fulfils all the criteria of an organ system. As part of our curriculum review and renewal, we have been faced with the dichotomous nature of the immune system per se, as well as the question: SHOULD IMMUNOLOGY BE TAUGHT AS AN ORGAN SYSTEM OR A DISCIPLINE IN THE SCHOOL OF MEDICAL SCIENCES, USM? (Fig. 1).

This paper will examine the proposal that immunology should be integrated into the curriculum both as an **ORGAN SYSTEM** and a **DISCIPLINE**.

Proposal:

After five years of experience with the teaching of immunology in the integrated curriculum of the School of Medical Sciences, Universiti Sains Malaysia (SMS, USM), we consider that our proposal is a logical step forward in the development of the SMS curriculum (Fig. 2). If one considers briefly the historical development of immunology as shown in Fig. 3, it has only been in the last few decades that immunology has made inroads as a clinical speciality and more often than not it is still regarded in many universities as a basic science.

At present, immunology is implemented as a discipline at SMS and integrated as shown in Fig. 4. We have no dispute with the content of the curriculum but problems have arisen as a result (Fig. 5).

The major problems occur in Phase I where basic immunology is taught in the 'Blood' and 'Host & Environment' Blocks. Experience has shown that the fairly recent inclusion of immunology in Blood is a poor solution to past problems in integration. ALSO it is not biologically consequent. Fig. 6 examines the distribution of the cells, organs and mediators of the immune system in the blood and in the immune system itself. It is obvious that most of these lie outside the blood.

Fig. 7 outlines briefly details of our proposal in which two alternatives are given; we favour the second alternative in which two blocks: CVS II and the Immune System would replace the existing Blood Blocks in both Phases I & II. It is also envisaged that all disciplines would have an input into the Immune System block (Fig. 8). The input of immunology as a discipline would include inputs into the Immune System Blocks (Phase I: basic immunology & immunopathology; Phase II: proliferative, regulatory and deficiency disorders) as well as inputs into Phase II: Host & Environment Block and all other existing blocks in Phase II (Fig. 9).

In conclusion, we strongly believe that the mixed economy design suggested here will produce a more effective implementation and integration of immunology in the current curriculum of SMS without requiring major alterations to the existing time allocated to the blocks in Phases I & II.

Summary:

Review of the existing immunology curriculum has brought forward a "mixed economy"-proposal of immunology being taught as both an Organ System and as a Discipline to overcome the current problems of integration in the curriculum of SMS, USM. As an organ system the immune system would have its own blocks in Phases I & II which with the new block CVS II would replace the existing Blood Blocks.

ORGAN SYSTEM?

IMMUNOLOGY

DISCIPLINE?

Fig. 1

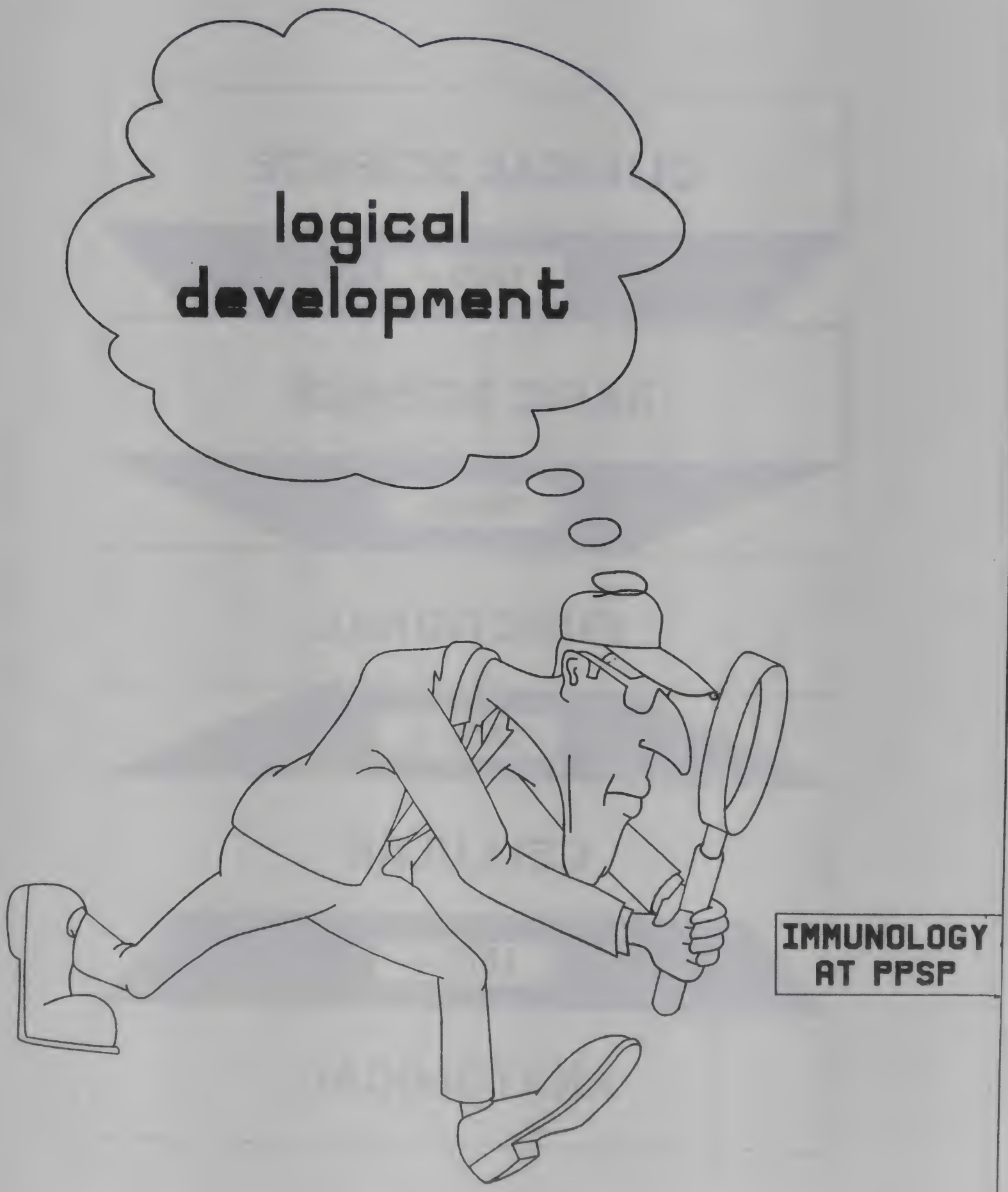

Fig. 2.

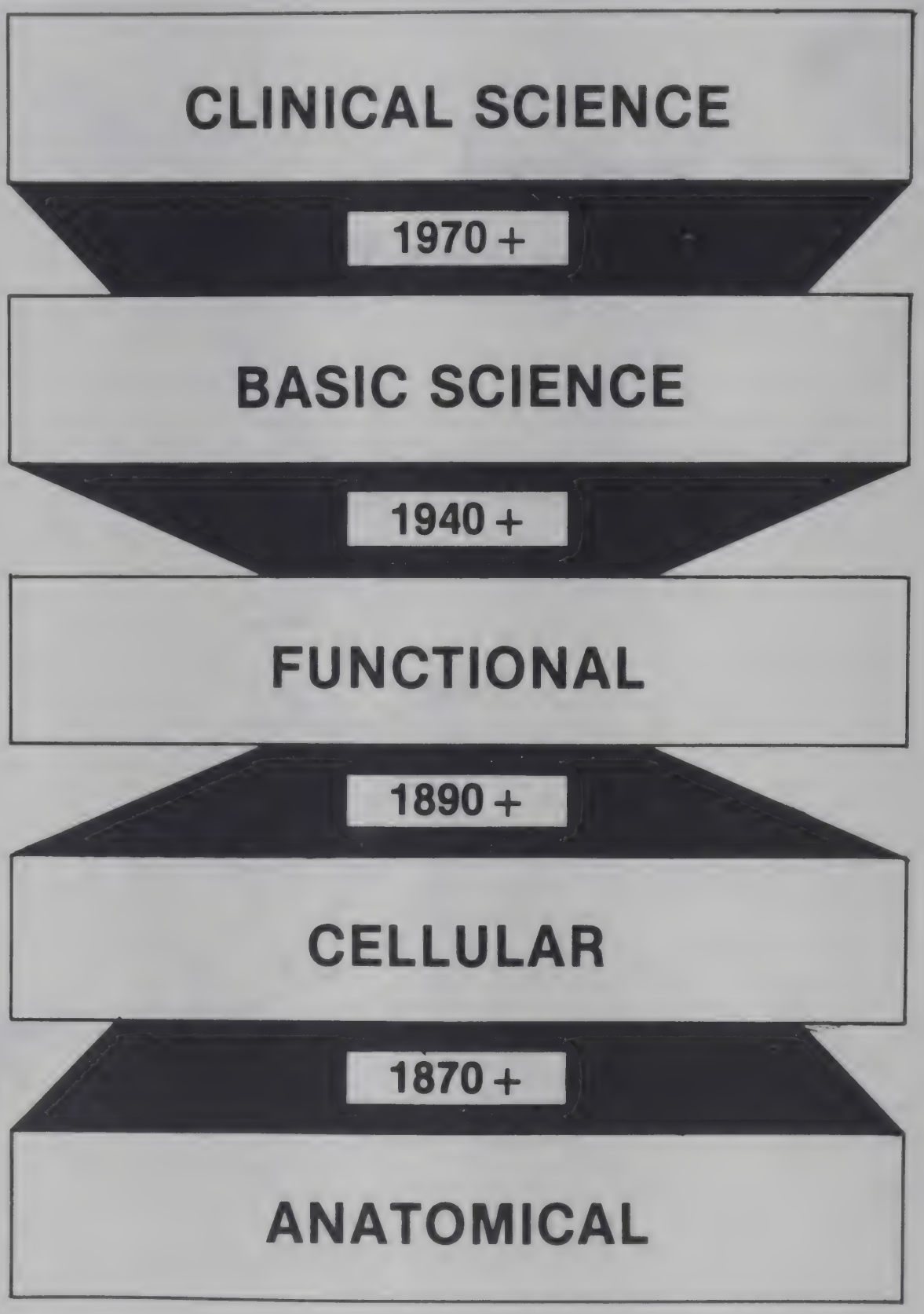
CLINICAL SCIENCE
1970 +
BASIC SCIENCE
1940 +
FUNCTIONAL
1890 +
CELLULAR
1870 +
ANATOMICAL

Fig. 3.

PRESENT IMPLEMENTATION SCHEME

PHASE	BLOCK	INPUT
I	Blood	Cells, organs, mediators, blood-grouping
	Host & Environment	Beneficial and nonbeneficial immune responses
II	GIT	GALT, pernicious anaemia
	Blood	Lymphoproliferative disorders, AIHA
	CNS	Cardiac autoimmunity, acute rheumatic fever
	Head & Neck	Allergy, immunology of eye & ear
	Psychiatry	Psychoneuroimmunology (introductory)
	Respiratory	Mucous surfaces immunology, BALT, allergy, CMI (TB)
	Skin	SALT, CMI: delayed hypersensitivity, autoimmune diseases of the skin
	Reproductive	Reproductive immunology, transplantation
	Musculo-skeletal	Rheumatology, systematic autoimmunity
	Endocrine	Organ-specific autoimmunity
	Communicable Dis.	Immune responses to microorganisms, immunization
III	Clinical Immunology	

Fig. 4.

CONSEQUENCES / PROBLEMS

1. Immune system not perceived as:

    1.1 organ system

    1.2 clinical science

    seen only as a basic science

2. Students:

    2.1 confused

    2.2 lack overall concept

    2.3 immunology unimportant —→

    * not a clinical science —→

    * no retention from Phases I to II

    2.4 poor understanding of immunopathology

Fig. 5.

IMMUNE SYSTEM

100% – – – – – – – – – – – – – – – – 50 – – – – – – – – – – – – – – – – 0%

BLOOD

0% – – – – – – – – – – – – – – – – 50 – – – – – – – – – – – – – – – – 100%

THYMUS	SPLEEN
LYMPH NODES/	BONE
FOLLICLES	MARROW
LYMPHOCYTES	
B CELLS	T CELLS
[MAST CELLS]	
MACROPHAGES	MONOCYTES
COMPLEMENT	
LYMPHOKINES	
IMMUNOGLOBULINS	
INTERLEUKINS	

Fig. 6.

PROPOSAL DETAILS

1. AS AN ORGAN SYSTEM:

1.1 **Phase I**

Alt. 1 Blood renamed HAEMOLYMPHATIC system, subdivided into blood and immune systems

Alt. 2 Erythroid)
Megakaryocytic) CVS II
Vessels)

1.2 **Phase II**

Alt. 1. Blood renamed as above science — →

Alt. 2. Blood divided into:

CVS & Immune system

Fig. 7.

IMMUNE SYSTEM AS ORGAN BLOCK

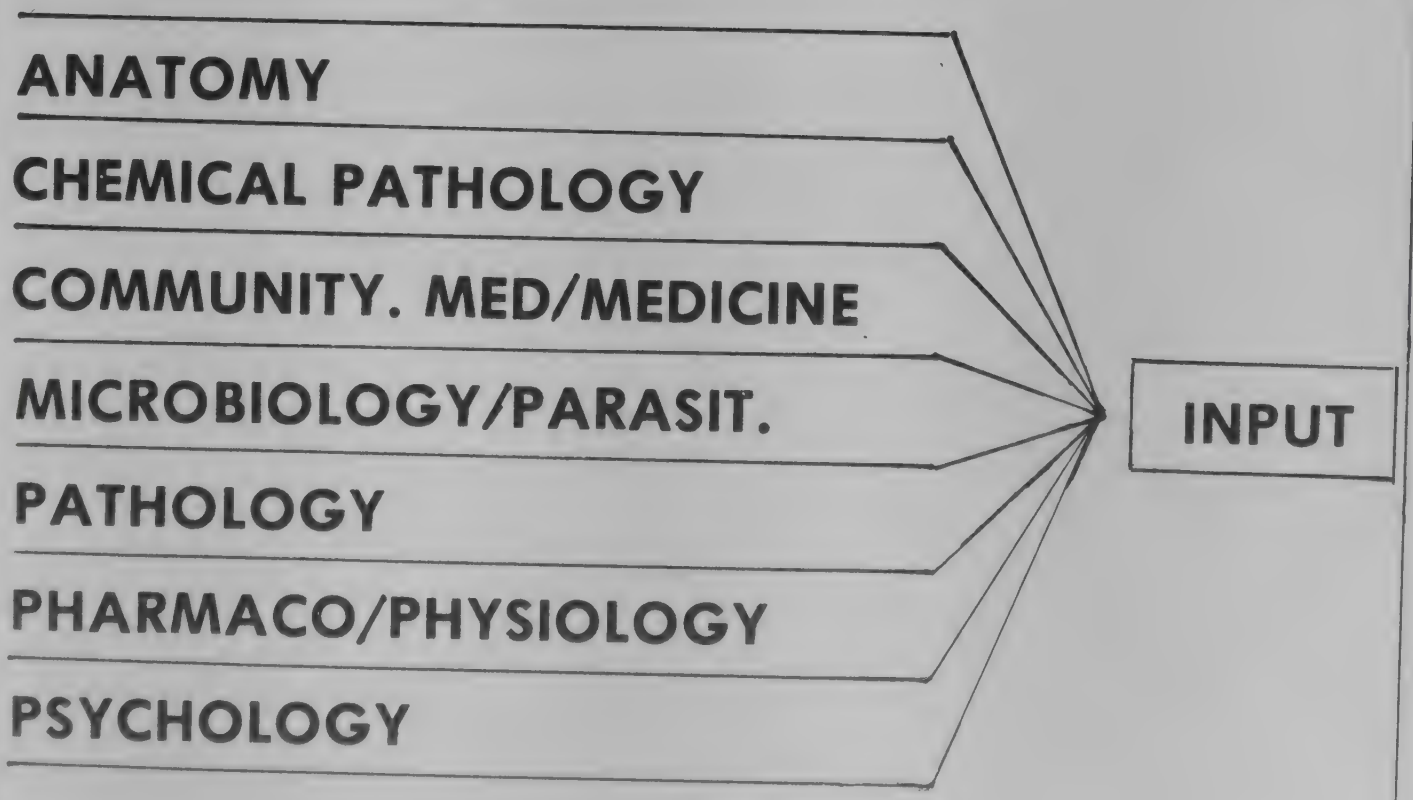

Fig.8

PROPOSAL DETAILS

2. AS A DISCIPLINE:

2.1 **Phase I**

Host & Environment: Immune response to pathogens

Immunization

2.2 **Phase II**

Immune System Block:

proliferative

regulatory

deficiency

All Other Existing Blocks:

as of now minus:

basic concepts of autoimmunity

& immune complex diseases

Fig. 9.

CURRICULUM IMPLEMENTATION

CURRICULUM IMPLEMENTATION: PROBLEM BASED LEARNING

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Problem based learning is defined as that involving small group of students given a real problem to solve; and the method is by discussion by the students using their prior knowledge to solve the problem.

The integrated organ system model, which when compared to the classical teaching method, did not create any gap between students and teachers. Under this integrated organ system model, facts are taught and organised around an organ of the body by independent departments. Students are guided what to do and later asked to recall.

Problem based community orientated approach was first introduced in McMasters Medical School and brought to Europe in 1974. Currently 25 medical schools all over the world are adopting it. Under this approach small group of students are given problems to analyse with a tutor's help. The learning process then would involve 7 steps — viz:

i. Clarifying terms and concepts not readily comprehensible.

ii. Defining the problem.

iii. Analysing the problem.

iv. Drawing systematic inventory of explanations and information.

v. Formulating learning objectives.

vi. Collecting learning objectives outside the group laboratories/libraries etc.

vii. Synthesising and testing the newly acquired information.

The speaker stressed that evaluation of learning process should not be as a form of hurdle to the students; on the other hand the evaluation should help the students as much as possible. The evaluation done is in the form of:

i. Formative — self assessment and block test.

ii. Summative i.e. progress test — constituted in MCQ and end evaluation test.

Using this new curriculum, Maastricht Medical School discovered that compared with traditional medical school, most of its students reach the final goal, and in shorter time.

The classical teaching method has not focussed on teaching-learning needs and is therefore irrelevant, without integration, continuity, link stimulation nor motivation.

In conclusion, medical education should offer educational experience that required students to be active and independent and evaluation should be on analytical skills rather than students' recall.

PLANNING AND IMPLEMENTATION OF TEACHING-LEARNING PROCESSES IN AN ORGAN SYSTEM BLOCK

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"What is the education that all physicians need and how can we make this process less brutal?"

John Cooper,
President A.,A.M.C.

The Phase II curriculum at the Medical School, Universiti Sains Malaysia, is Organ System Based. The teaching-learning processes are designed as multi-disciplinary packages, centering around clinical problems. This paper outlines the planning, structuring and implementation of an organ system block. This involves the co-ordinated activity of a Block Committee comprising of members from relevant disciplines. The multifaceted teaching-learning activities that are built into the problem packages are outlined. Critical evaluation of the packages both by students and staff is a continuing process and is part of the implementation process. Successful outcome of the entire process can only be achieved by the high level interaction of a staff who is committed to the philosophy of our curriculum.

OUR AIM

The aim of our Medical School is to train doctors who will:

(a) Have the capability to solve common and potentially serious clinical problems.

(b) Be aware of the problems in terms of delivery of health care at the community level.

(c) Be aware of the preventive aspects of medicine.

(d) Have the potential of continuing education to fulfill the role of future teachers and specialists.

THE CURRICULUM

Our students are introduced to the problems he would face in his future career early in their medical education and teaching-learning experiences are centered around these problems. The curriculum is designed in three phases. In Phase II, the modality is Problem Based, where the emphasis is on the Basic Sciences — not in isolation but with reference to the understanding of the problems.

General Outline of the Medical Education Programme

PHASE I (1st Professional Year)	The student is exposed to basic foundation courses as well as being introduced to the behavioural sciences
PHASE II (2nd & 3rd Professional Year)	The implementation of the integrated systemic approach to professional education with a stress on relevance.
PHASE III (4th & 5th Professional Year)	Stress is on problem solving and clinical clerkship

In Phase III of our programme, the student goes on to apply such knowledge gained to solve these problems in terms of investigation diagnosis and management. Thus in problem based learning, integration of the basic sciences becomes inevitable. Apart from making the study of basic sciences more meaningful, this approach also allows emphasis on those areas of basic sciences which are relevant and appropriate to the understanding of the clinical problem. Clinical problems cut across disciplines and are related primarily to organ systems and hence the need for an organ system based approach.

The course is divided into 12 organ system blocks and each block is planned for implementation as a number of 'working problems' (Table 1). The working problems consists of integrated course units developed by the contribution of learning experiences from all relevant disciplines. The package is designed to achieve a common interdisciplinary goal.

PLANNING OF AN ORGAN SYSTEM BLOCK

The Organisation

The planning and delivery of an organ system block is affected by a working committee, known as the BLOCK COMMITTEE (Table 2 & 3). A block committee should be suitably represented to reflect the discipline input into the problem packages. One of its members function as the Chairman, known as the Block Co-ordinator. The block co-ordinator is responsible for the overall planning and implementation of the block. Members within the block are assigned responsibilities to effect the different facets of the implementation process. The planning of the block passes through several stages and takes at least 4—6 months before it is ready for implementation (Appendix I).

TABLE 1

THE ORGAN SYSTEMS/BLOCKS

Gastrointestinal	Musculoskeletal
Cardiovascular	Reproductive
Renal	Haemopoietic
Respiratory	Communicable Diseases
Central Nervous	Head and Neck
Endocrines	Psychiatry and Skin

The duration of each block is 5 weeks and the problems are usually designed to run through the week, though the time allocation need not be as rigid.

TABLE 2

THE PLANNING OF A BLOCK

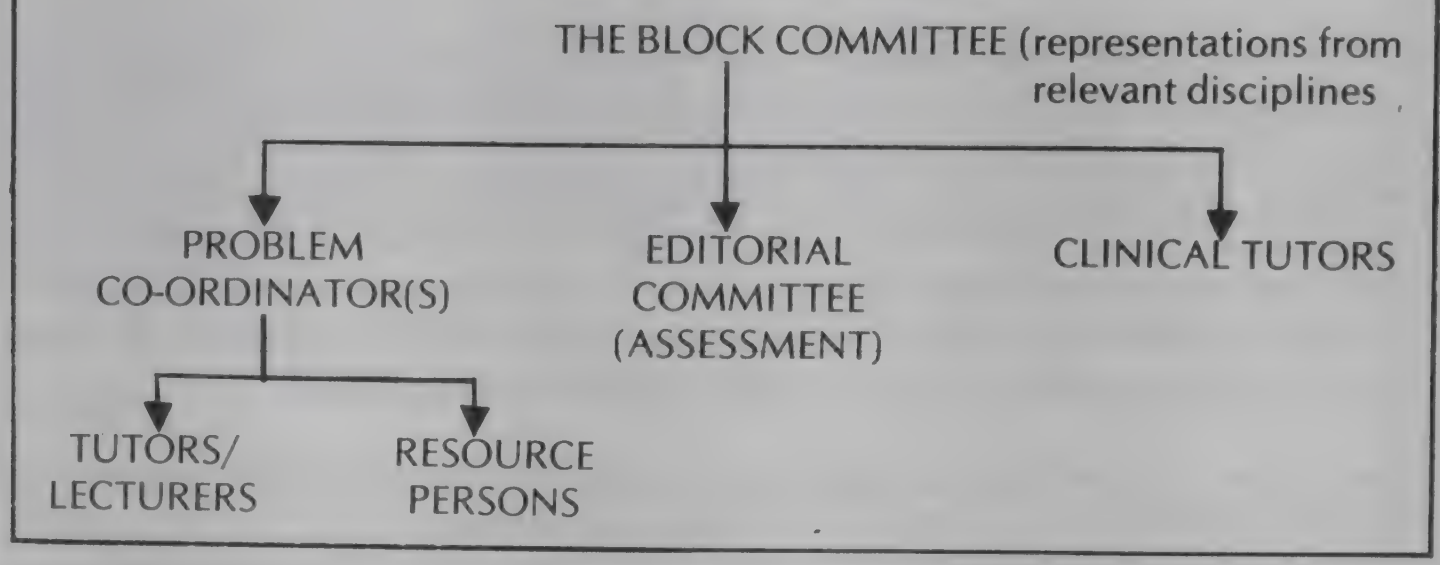


TABLE 3

THE PLANNING OF A BLOCK

	STAGES IN PLANNING	RESPONSIBILITY
1.	Formation of Block Committee	Phase II Sub-Committee
2.	Review of General Objectives	Block Committee
3.	Planning of the Block	Block Committee
4.	Casting the problems	Problem Co-ordinators
5.	Preparation of the materials	Resource persons
6.	Planning the Assessment	Editorial Committee
7.	Evaluation and Revision	

Learning Objectives

The Block Committee works within the ambit of the General Objectives which have already been defined in an earlier exercise. The formulation of the general objectives is an extensive procedure involving the group activity of all the block committees, under the guidance of the Phase II Sub-Committee. This document is finally ratified by the School Board.

However, the General Objectives is not a static document. During the planning of a block, the objectives are reviewed by the Block Committee and if necessary, re-defined in the light of:

1. Feedback from staff and students on previous implementation.
2. Discussions with the Phase I Co-ordinator of the same block

Review and re-definition of the general objectives is a vary important aspect of planning and the process is repeated every time the block is planned for implementation. Additions and deletions to General Objectives is subject to approval of the Curriculum Committee.

Specific objectives of the problem packages are merely a restatement of the general objectives in context, in more detail to facilitate the implementation process.

Identification of the 'Problems' and their discipline content

A working paper outlining the

1. problems selected
2. basis for the selection of the problems (Table 4)
3. Discipline input into each problem (Table 5).

is circulated by the Chairman of the block to the members of the committee.

Members meet to discuss the 'blue print' and during the proceedings, they may delete, add or modify the plan submitted by the Chairman. All decisions with regards to the number and nature of the problems, discipline input into each problem and the methods of implementation are identified and concensus reached by the Block Committee (Table 6).

TABLE 4

GUIDELINES FOR PROBLEM SELECTION
1. Related to Block Objectives
2. Appropriate to new graduate
3. Common in a given community
4. Serious or potentially serious
5. Spans subject widely
6. Has implications of prevention
7. Minimal overlap of subject area between problems

TABLE 5

PROBLEM BASED LEARNING — GASTROINTESTINAL TRACT	
PROBLEM	**CONTENT — DISCIPLINE INPUT**
Working Problem	Anatomy of liver & biliary tract Radiological anatomy
— Jaundice due to Infective Hepatitis	Haemoglobin catabolism & formation of bile/bile pigments/salts Enterohepatic circulation Liver function tests Pathology of jaundice Common causes of jaundice Cholecystitis/cholelithiasis Virology of infective & serum hepatitis Epidemiology of hepatitis Immunology of hepatitis B Drugs & liver Prevention & control of hepatitis outbreak

AN EXAMPLE

TABLE 6

GASTROINTESTINAL SYSTEM — PROGRAMME OF WORKING PROBLEMS, STUDENT & STAFF SEMINARS			
DATE REGION	**PROBLEM**	**PATHOLOGY**	**SEMINARS**
7.3.83 Oesphagus	Dysphagia	Carcinoma of oesophagus	
14.3.83 Stomach & Duodenum	Epigastric pain	Duodenal Ulcer	Peritonitis
21.3.83 Liver	Jaundice & Loss of Appetite	Viral Hepatitis	Extra Hepatic Biliary Obstruction
28.3.83 Liver	Haematemesis	Cirrhosis of liver	Bleeding PR
4.4.83 Small Intestine	Colicky Abdominal Pain	Intestinal Obstruction due to Bands	Abdominal Hernia
11.4.83 Small Intestine Pancreas	Loss of Weight	Malabsorption Pancreatic disease	Bacterial and viral infections of the GIT
18.4.83 Large Intestine	Diarrhoea with Blood and Mucus	Amoebiasis	Parasitic Infection of the GIT

Casting the Problem/Basic Problem Structure

Problem Co-ordinators identified among the members of the Block Committee prepare detailed documentation of the problem packages with regards to their implementation. The component of the package will include:

1. statement of specific objectives and their manner of implementation
2. time-table of the week's programme (Appendix 2)
3. a flow chart describing how the problem unfolds and outlining the activity of each slot as it appears on the time-table.
4. trigger materials for the small group sessions.
5. the tutors guide
6. learning objectives of the clinical teaching sessions
7. guidelines and materials for self learning which includes references, learning units as handouts, fixed learning modules, audio visual aids, etc.

The problems are generally based on common clinical situations. The problem unfolds as a series of small group learning sessions and the number of sessions vary according to the quantum of data that needs to be incorporated in the package in order to achieve the objectives of the problem (Table 7). The sequencing and segmentation of the data generally follow the process of actual patient management in terms of history taking, physical examination, differential diagnosis, investigation and follow-up. The segmented data (trigger materials) are introduced in the form of handouts, video clips, etc. (Table 7). The data furnished during each session is utilised to formulate a hypothesis by recall of existing knowledge and new areas of learning necessary to refine such hypothesis are defined. The students are then directed to appropriate learning processes.

TABLE 7

PROBLEM BASED LEARNING — SMALL GROUP SESSIONS (SESSION I)		
CUE	**GROUP ACTIVITY**	**PREPARED MATERIAL**
Presenting Symptoms and relevant observations or circumstances	Discussion of existing knowledge of the area — define questions to which answers are needed in order to produce differential diagnosis list	Notes on presenting symptom and possible causes

'The principle aim is that the students should be able to define for themselves the relevant learning from every discipline that they need to undertake in order

to understand the clinical problem. The structure built into the problem should expose them to the process of clinical reasoning and independent learning.' (ROD NEAME).

Important concepts are introduced in the form of lectures and integrated multi-disciplinary demonstrations are organised to reinforce theoretical concepts. Wherever necessary, learning units prepared by tutors are introduced as self learning materials. During this multi-faceted activity which occurs between small group sessions, the students acquire relevant knowledge which helps them to refine their hypothesis in the subsequent small group sessions. A series of alternating small group learning sessions and inter-sessional learning activities eventually culminates in the learning of those basic sciences that are relevant to the understanding of the problem.

Student Seminars

Student seminars have been introduced in an attempt to

1. broaden the scope of the week's programme by branching and generalisation
2. help the students to develop skills and independent learning.
3. promotes attitudes and communication skills.

Clinical Teaching

One of the stated aims of the Phase II Curriculum is 'to integrate the teaching of basic medical sciences with that of the clinical sciences and as such to provide a scientific understanding of the diseased processes as they affect the various systems of the body.'

Introduction of clinical sessions early in the curriculum

1. Removes the boredom of study of a mass of scientific facts in isolation
2. Leads to a more effective learning of the basic sciences in terms of understanding and retention
3. Shows relevance and thus leads to motivation
4. Leads to early development of clinical skills and hence confidence.

The integration of clinical disciplines and the basic sciences inevitably leads to the collaboration of respective staff members in the planning of the curriculum. This in turn results in the definition of objectives which are more meaningful and appropriate. This also creates an awareness among the members of the faculty to think not in terms of departmental but institutional objectives which run true to the basic philosophy of the school.

Conclusion and comments

A very brief account of the basic planning of a Problem Based, Organ System Block has been outlined. Several questions have been raised with regards to the effectiveness of the system. One such area that comes under frequent discussion is whether one can achieve adequate coverage of the preclinical sciences by the problem based approach. This in turn leads us to another query.

How much is adequate knowledge? This is a quantum that cannot be determined at a single point of time or period. Acquiring knowledge is a dynamic process and the need grows as one grows in his career. What is necessary is to define our limited objectives which will meet the basic requirements of our doctors as we have already stated. It is appropriate at this point in time to recall one of our objectives most aptly stated in a keynote address delivered at the International Workshop on Medical Education, organised by the Universiti Sains Malaysia : A relook at Medical Education in the Eighties'). 'The students on graduation should be able to diagnose **common diseases** and **acute emergencies** and institute **firstline** of management before **referral** for specialised treatment. (Roslani, 1981). This objective is a constant theme in our planning and its awareness safeguards us from errors of omission of important areas of learning.

Another question that has been raised in why not a Problem Based or Centered approach from the very beginning of the course. Our curriculum has been tailored to meet the requirements of our students. We believe that in the first year (Phase I) a foundation course in the basic sciences, yet, not in isolation but as integrated organ system units, is an ideal 'knowledge base' for the introduction of problem based learning in the subsequent years. Though this foundation course is not structured in the light of clinical problems, a constant attempt is made to draw clinical relevance during the planning and implementation of the different blocks. In Phase II learning process is centered around clinical problems, but within the context of organ system blocks. Thus two well developed and recognised approaches to integrated learning have been dovetailed in our planning, resulting in the development of an integrated curriculum which is both Problem Based and Organ System orientated.

Another area of concern is that our students may develop a tendency to approach patients in terms of isolated systems and not the patient as a whole. In real life clinical situations, diseases more often affect isolated systems, though they may cut across several systems in their peripheral manifestations. Hence it cannot be gainsaid that an integrated systematic approach is an ideal way a disease process can be best understood in its entirety. However a holistic approach to patients should be borne in mind both by students and staff during the implementation of the clinical sessions.

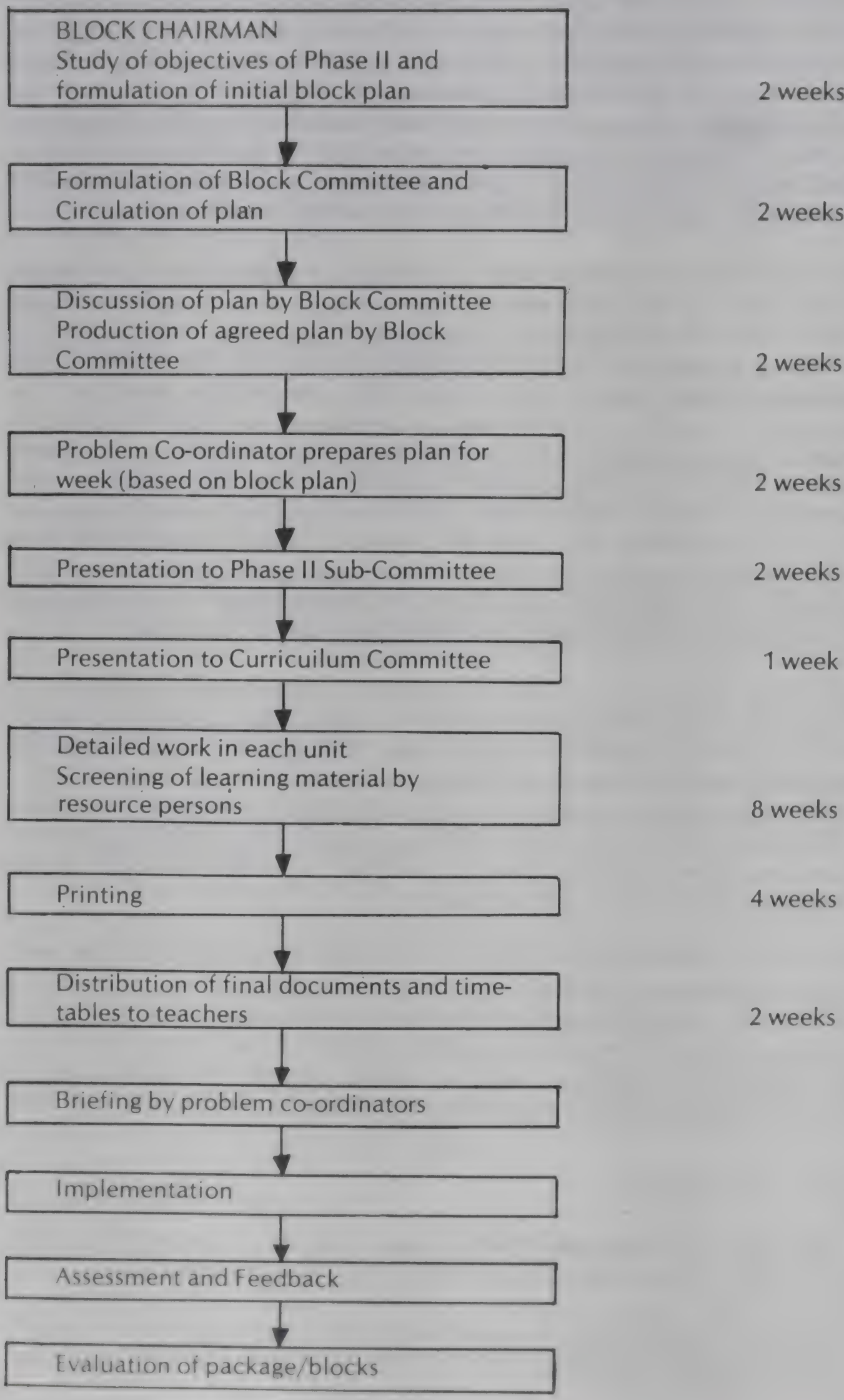
All these questions raised points us to one important factor and that is the need for very careful planning before implementation of a block. The system needs a dedicated staff who believes in the system and more importantly the students too should believe in the system. Looking forward to the future, there is no doubt that positive feedbacks from our young graduates will give us, both students and staff, sufficient reassurances to forge ahead with what we have come to believe in.

ACKNOWLEDGEMENTS

1. Members of the past and present Phase II and Block Committees, whose deliberations have helped to formulate our Phase II programme.

2. Assoc. Prof. P.K. Dass, for his valuable suggestions and material on the problem package 'Yellowish discoloration of Eyes' which has been included as an example.

TIME-TABLE FOR COMPLETING THE TASKS IN THE PREPARATION OF A BLOCK


BLOCK CHAIRMAN
Study of objectives of Phase II and formulation of initial block plan
2 weeks
Formulation of Block Committee and Circulation of plan
2 weeks
Discussion of plan by Block Committee
Production of agreed plan by Block Committee
2 weeks
Problem Co-ordinator prepares plan for week (based on block plan)
2 weeks
Presentation to Phase II Sub-Committee
2 weeks
Presentation to Curricuilum Committee
1 week
Detailed work in each unit
Screening of learning material by resource persons
8 weeks
Printing
4 weeks
Distribution of final documents and time-tables to teachers
2 weeks
Briefing by problem co-ordinators
Implementation
Assessment and Feedback
Evaluation of package/blocks

GASTROINTESTINAL BLOCK

Phase II — Week 2

TITLE — YELLOWISH DISCOLORATION OF EYES

	8.30 – 9.30	9.30 – 10.30	10.30 – 11.30	11.30 – 12.30	2.00 – 3.00	3.00 – 4.00	4.00 – 5.00
ISNIN	Summing up — Assessment Feedback	PBL I	Approach to Jaundice (L)		Bahasa	**FLM** Anatomy Biochemistry Physiology	Applied anatomy of Biliary tract
SELASA	Tamadun Islam	CFCS			Clinicals		
RABU	Drugs & Fever (L)	PBL II	Seminar — Viral Hepatitis		**FLM** — Pathology, Radiology, Microbiology, Immunology		
KHAMIS	PBL III	Self Study	Cholestasis (L)		Clinicals		
JUMAAT	Student Seminar Malabsorptive syndrome	Brie-fing of Prob. III	Self Study		Clinical in Campus		
SABTU	CFCS						

CURRICULUM IMPLEMENTATION: THE TASK AND PROBLEMS OF COMMUNITY-BASED EDUCATION

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1 — THE TASK

For decades, in my country and most other countries, the task of implementing a medical curriculum used to be an easy job that had only a few problems worth mentioning, at least to such a distinguished gathering, on such a memorable occasion. That is why, a few days after I had settled in my new job as a Founding Dean of the Faculty of Medicine at Suez Canal University, in October 1977, the Secretary General of the University asked me to be ready with the bylaws of the "new" school, which included the curriculum for the University Council meeting to be held a few weeks later. His request was completely justified. A few days were more than enough to photocopy the curriculum of any of the 10 existing medical schools, since all were the same and followed the conventional curriculum of the 150 years old prestigeous Kasr El-Aini medical school of Cairo University, revised 50 years earlier. But this was not my mandate and it was almost 4 years later that the Secretary General had the curriculum in his hands. The mandate was to introduce and implement the great changes in medical education. This amounted to a complete reorientation to bridge the wide gap between the current education of medical graduates at that time, and their successful functioning as health care providers who would meet the health needs of the people and serve them efficiently, effectively and humanely.

The need for this change was acutely felt in Egypt as a compelling national need (Fayoum Conference, 1978)[1], a feeling which was certainly augmented by the powerful global movement towards HEALTH FOR ALL (ALMA-ATA, 1978)[2] and the necessity to reorient national health care delivery systems towards primary care to serve that goal. The role of health professions educational institutions in this process has been defined by the almost simultaneously emerging concept of integrated Health Services and Health Manpower Development (HSMD), which indicated that the quality and quantity of health manpower have to be planned in response to the specific needs of the national health system and, through this, to the health needs and demands of the population (WHO/EMRO, 1978)[3].

Challenged by the demands of their newly defined role, health educational institutions, including medical schools had to revise their curricula with the objective of educating graduates who are competent to serve effectively in the

proper time and proper place demanded by the system (Fig. 1). Quoting Fullop (1984)[4] "graduates of medical programmes should certainly be able to:

- respond to health needs and expressed demands of the community.
- work with the community.
- stimulate healthy life-style and self-care.
- educate the community as well as their co-workers.
- solve, and stimulate the resolution of, both individual and community health problems.
- orient their own as well as community efforts to health promotion and to prevention of disease, unncessary sufferings, disability and death.
- work in, and with, health teams, and if necessary.
- provide leadership to such teams.
- continue learning life-long so as to keep their competence up-to-date and even improve it as much as possible."

To create and implement the curriculum that would adequately educate such graduates have become the major task of health sciences educational institutions.

Far from being a simple task, it is a major undertaking that teems with challenging problems. It is our job to identify those problems, work at their solution, overcome them, and avoid giving way under their heavy pressures to the warm comfort of the "conventional"

II — THE PROBLEMS

Medical educational programs that train the above described sort of graduate, are characterized by curricula that "focus on population groups and individual persons, and which take into account the health needs of the community concerned" (WHO, 1979)[5] Thus defined, this is **community-oriented education.** (COE).

The educational activities that constitute the curriculum in a community-oriented educational program, or institution, should obviously be based largely in the community and in close relationship to it, in a diversity of health service settings, the same as, or closely similar to, those in which the graduates will function as future health care providers. Such is the definition of **community-based education** (CBE)[6] which in itself is a tool to achieve the overall goal of community-orientation of the whole institution, students and faculty alike.

THE PROBLEM NO. 1 — HOW TO DO IT?

The answer to this question is that THERE IS NO EXISTING READY-MADE RECIPE FOR CBE. Most probably such a UNIVERSAL recipe will never exist, or should never exist.

So far CBE is being adopted by only a few medical schools, including the 18 full members of the Network of Community-Oriented Educational

Institutions for Health Sciences. They are all rather young. Although they have many features in common and do try to share their experiences and learn from each other, yet, there is an obvious and pressing need for comparative studies of the diverse solutions that have so far been developed for problems of planning, implementation, and a more extensive exchange in experience.

Even when the design of CBE programmes and the mechanisms of integrating them purposefully with the objectives, policies and structures of the educational system gain more definition and wider agreement, the implementation of CBE programmes is so intricately tied to the local socio-economic, geographic and political environment that universal receipes can be unworkable and even harmful. The principle therefore is to ADAPT and not to ADOPT.

Basic principles and ingredients of a CBE program.* [6]

True there is no ready-made recipe, but the ingredients of CBE, the underlying principles, are known.

A CBE CURRICULUM SHOULD:

1 — Reflect — as a whole — the priority health problems and needs of the community.

2 — Promote a community orientation from the outset of, and throughout, the curriculum.

3 — Foster a holistic approach to health care that considers the whole of the needs of the person.

4 — Foster a high level of health education to the public designed to promote health promotion and prevention of disease.

5 — Foster students' problem-solving abilities as well as "learning how to learn", leading to educational self-reliance.

6 — Ensure valid assessment of the competencies that students should acquire from CBE.

7 — Promote the health team approach.

COMMUNITY-BASED LEARNING ACTIVITIES SHOULD BE:

1 — Geared to planned goals and objectives that derive from explicitly stated expected professional competencies.

2 — Introduced very early and must continue throughout the educational program.

3 — Viewed not as peripheral or casual experiences but as a standard, integral and continuing part of the educational process.

4 — Involving students in real work and participation in service geared to their training needs.

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*See Reference No. 6

A Community-based Activity Vs. A Community-based Curriculum

It is important to differentiate between a community-based (C-B) **activity** and a community-based (C-B) **curriculum**. A community-based learning activity is an activity that takes place within a community. Field trips, training in the offices of family physicians for weekly half-days or full days for a certain period, or even field projects when performed in an isolated manner unrelated to an otherwise conventional curriculum, are all examples of C-B-learning activities; but they do not constitute a C-B-curriculum.

A curriculum can be called "community-based if it includes throughout its entire duration an appropriate proportion of learning activities, in a balanced variety of educational settings in the community and in a diversity of health care services at all levels. The appropriate distribution of the C-B-learning activities and their integration and incorporation within the overall educational program are essential characteristics of a community-based curriculum.

PROBLEM No. 2 : New schools — Established schools.

Conventional curricula are not based on the foregoing principles which imply a new and different orientation of medical education, and a genuine change towards relevance to the health needs of the people. The dimensions of reorientation and change are so great that a trial to introduce them in a conventional curriculum, where various disciplines compete for curricular hours would be a formidable task, indeed a real battle where every Professor is willing to fight to the finish for the integrity of the territory of his discipline. No wonder, because conventional curricula are discipline', rather than community-oriented. The battle usually ends by the finishing of the innovators (Martenson, 1985)[7] . New schools may need to be established. A real breakthrough may be the creation of a community-based track that runs in parallel and coexists with the old conventional curriculum.*

PROBLEM No. 3 : The right leadership — The right people :

At present, the movement of community-oriented education is certainly growing and gathering strength all over the world. Still however, in a given country, or institution it is a pioneering endeavour to try and materialize a community-based curriculum that is worth its name. When you come to the heart of it, all the problems of planning and implementation are surmountable if you have the right leadership and the right critical mass of people who are willing, and able to DO IT. In their absence, any single problem is enough to force you back to the "conventional". The issues here are commitment, creativity, an imaginative yet pragmatic approach, social awareness and sensitivity, political abilities, perseverance, courage, proficiency in medical education, credibility, both personal and professional, good role-modelling, and last but not least, managerial abilities. Ultimately it will be the graduates of the CBE programmes who would best carry out the implementation of such programmes.

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*Examples of such "Parallel Innovative Tracks" exist in several schools e.g. University of New Mexico Medical School and the new Problem-based Track on Harvard Medical School (USA).

PROBLEM No. 4 : Collaboration with the health sector :

CBE requires a functioning stable, coordination between the educational institution and the health services. This is crucial for many reasons.

- Priority health problems need to be heavily represented in the curriculum.
- Student's learning — training takes place largely in the various health settings of the community.
- There needs to be a continuum between what happens within the walls of institution and outside in the community. The two processes should not be segregated in the student's mind. Likewise there should be no segregation in the organizational structure, and most importantly, in the minds of the administrators and the personnel on either side of the fence. There should be no fence. Instead there should be coordination and integration (3). Experiences, however, show that the accomplishment of this task is often not only an organizational challenge but also a behavioural one that masks vested interests and professional rivalry. University teachers and health personnel alike need to descend from their respective ivory towers and work together in a coordinated effort to teach and serve. The exact manner is which such a coordination-integration can be brought about is dependent on the local administrative, socio-economic, political and even cultural and behavioural practices and policies. It may require the establishment of joint committees, contractural relationships, joint appointments, issuing new laws or political decisions at the highest level. (5). In every case, however, successful coordination, will be brought about if the right people are there, who can conceive the rationale, the benefits of coordination and integration and commit themselves to its success.

  Collaboration should start early in the planning phase of the educational program and must continue and grow throughout implementation. Gradually and ultimately a new shape and a new way of life, are imparted to both the educational and service components of health care to foster the meaningfulness of the former and the quality of the latter. This is the essence of the Health Service Manpower Development Concept.

PROBLEM No. 5 : The use of the community — Community involvement :

Community-based educational curricula need to, and do, use the community extensively for educating students. Communities do not like to be used. They need to, and should be served. People will not readily accept the argument that they should be used now for the benefit they get tomorrow from the graduates of CBE programmes. To accept the students they expect to be served now by the students and their teachers. Also they need to be involved, really and meaningfully and not by lip service, in the planning and implementation of the C-B-educational activities. The challenge to curriculum planners is to plan and implement the community-based students' activities in a way that brings about both service to the community and relevance to students' learning — training at the same time. This is possible for example by conducting the activities in under-served areas or carrying out a research project to solve a health problem that is deeply sensed by the local community. An antagonistic attitude will ensue if sectors of the community

feel that they are overused by the programme and that its services are directed only to privileged strata. This would destroy the programme and virtually forfeit its objectives.

PROBLEM No. 6 : Issues in curriculum design.

A) Community orientation should be spelled out explicitly in the institutional goals. Those goals should govern, dictate and guide the whole life of the institution, from curriculum planning to the nitty-gritty of implementation, the selection of teaching staff, their activities and criteria for reward and promotion, students' selection and, where applicable, learning activities and the evaluation system.

B) Community-based activities should not appear as isolated spots in the curriculum. They should permeate the whole curriculum and be planned and geared to provide the major stimulus and medium for good quality learning of the "required" basic, biomedical, community health and behavioural sciences. "Requirement" is dictated by the competencies that need to be acquired by the graduate to fulfill his professional role and should be derived from a task analysis of the expected professional profile. In this sense it is a competency-based curriculum. This approach has far reaching implications.

C) Field work is no longer the sole prerogative of community medicine or public health departments. Faculty members from many disciplines should define the educational objectives, and design the educational activities, in their implementation and evaluation. This multidisciplinary effort should also involve health personnel in students' efforts learning-training. This sharing is crucial to CBE curricula and foreign to conventional discipline-based ones. Many barriers, departmental and psychological need to be broken to achieve successful implementation. This means a different and compatible organizational structure of the medical school itself.

D) Valid performance assessment of community-based students activities and its integration in the overall institutional assessment system are essential. The design of the valid evaluation instruments, the need to carry out the evaluation at the actual place of performance and to involve the personnel who share in students' supervision and training, the maintenance of reliability and consistency of evaluation when activities are being carried out in different places, some of them remote, with different people in different circumstances, all these are considerations that pose problems to be solved by administrators of community-based curricula. They have the duty of maintaining the institutional responsibility of graduating safe, efficient and effective physicians who will be community-oriented.

In the Faculty of Medicine at Suez Canal University, students in every phase are not allowed to sit for the end-of-phase written examination unless their field work assessment has been satisfactory.

Fig. 3 provides an example of the rating form used to assess the performance of students of the Community-Based Experience and Service (COBES)

programme at the Faculty of Health Sciences, Ilorin, Nigeria. From the second to the fifth years of the curriculum students are posted twice a year to rural communities for one month at a time. Accompanied by their tutors, students describe the community, identify a major health problem, analyse it, interpret the data and prepare a written report.

Student name
Group leader

Staff

Date of posting
Place of posting

1 Unsatisfactory	2	3 Satisfactory	4	5 Distinction

Please mark X in the appropriate box below.

	Mid Posting	End of posting
1 — Appearance and general behaviour	☐☐☐☐☐	☐☐☐☐☐
2 — Punctuality	☐☐☐☐☐	☐☐☐☐☐
3 — Attitude toward the COBES programme	☐☐☐☐☐	☐☐☐☐☐
4 — Relationship to other student	☐☐☐☐☐	☐☐☐☐☐
5 — Relationship to people in the community	☐☐☐☐☐	☐☐☐☐☐
6 — Collection of data.	☐☐☐☐☐	☐☐☐☐☐
7 — Presentation of data	☐☐☐☐☐	☐☐☐☐☐
8 — Interpretation of data	☐☐☐☐☐	☐☐☐☐☐
9 — Ability to relate findings to solving community health problems.	☐☐☐☐☐	☐☐☐☐☐
10 — Students critique of his own approach to the problems	☐☐☐☐☐	☐☐☐☐☐
11 — Ability to suggest new approach to the solution of the problems	☐☐☐☐☐	☐☐☐☐☐
12 — Contribution to group discussion.	☐☐☐☐☐	☐☐☐☐☐
13 — Performance in crisis situation	☐☐☐☐☐	☐☐☐☐☐
14 — Assessment of the students written report.	☐☐☐☐☐	☐☐☐☐☐
	TOTAL SCORE	

Remarks by the group leader .....
Student's comments on his own performance (The group leader is to discuss the performance with the student concerned, at mid posting and end of posting and enter here relevant points which might come out of the discussion).

Date ..... Signature of the group leader .....

COBES, ILORIN, NIGERIA

Fig. 3 : Rating Form, COBES Programme, Ilorin, Nigeria.

The assessment carried out the basis of a series of Likert scales (1 to 5) explores not only the quality of the output (written report. — item 14) but also the process by which each student has attained the objectives (items 1 to 13) and the quality of interaction with people in the community (item 5).

PROBLEM No. 7 : How should students learn? — CBE and problem-based learning.

Among institutions that adopted community-based curricula, a few also adopt problem-based learning as an educational strategy. The prototype is the Faculty of Medicine at Suez Canal University, where learning throughout the six years of the community-based curriculum is solely problem based. Problem-based learning (PBL) is the learning that results from the process of working toward the understanding or resolution of a problem. It is learning by discovery. It is not simply the presentation of problems to students as a focus for learning or an example for application of already "given" knowledge.

It is a rigorous, structured approach to learning that is tailor-made for medical education (Barrows and Tamblyn, 1980)[9] .

Our experience at Suez Canal University is a living demonstration of the mutual relevance of the beneficial interaction between the two strategies to the education of the student to acquire the right competencies required for the "Doctor of Today".

Thus students' learning is triggered by, and results from either written problems which they work up together in small groups (group learning) in the classroom, as well as from actual individual and community health problems they encounter in their work as a team during their community-based field activities. Both written and live problems would fire their enquiry and drive them in the pursuit of knowledge and skills in the library, the laboratory and from subject matter experts both within and outside the school. The student would follow the same steps of problem definition, analysis, hypothesis generation, formulation of learning objectives, collecting information, and testing "solutions" followed by self, peer and tutor evaluation, whether handling a classroom or a field problem. The student acquires problem-solving as a way of thinking, an attitude, a way of life. At times classroom problems are derived from actual problems appearing in the students reports on their field work. The sense of reality and continuing novelty and the stimulating variation in the learning experiences brought about by this approach cannot be missed. Besides, the competencies of problem solving, self-directed learning, critical thinking, critical appraisal of evidence, self evaluation working in a team and learning from each other are all deeply entrenched in the mind and behaviour of the student.

Problems to be presented to the students are selected and formulated according to certain criteria. They deal with common individual or community health problems that are manageable, they could also be biomedical problems. Besides being stimulating, the expected educational objectives that would be derived by students would fall within the planned objectives and competencies of the educational phase.

An example of a community-based, problem-based educational experience

The problem : Schistosomiasis is the most prevalent endemic disease in Egypt. It is prevalent all over the Nile Valley, infection being acquired by contact with the snail via intermediate host-infested canals ramifying throughout the valley. Schistosomiasis has never been reported in the indigenous Bedouin population of Sinai which has so far been deprived of Nile water. The need for development of the Peninsula has prompted major irrigation schemes to be planned based on extending water canals eastwards underneath the Suez Canal. Already an area east of the Bitter Lakes is being cultivated on Nile water through a canal that had been dug several years ago. More extensive irrigation schemes are underway. The questions were:

- How far did the expected, albeit so far never reported, transmission of schistosomiasis afflict the inhabitants?
- Has preventive measures been taken? If not what measures could be taken to protect the people in this situation and to be recommended for the larger scheme to follow?
- Infected persons if identified would be treated.

This was the problem selected by a group of the fourth year medical students at the Faculty of Medicine at Suez Canal University as a subject of their 6 weeks elective study period. The students identified the problem, planned their study, defined areas of knowledge and skills needed to be able to conduct the study, prepared a budget and itinerary, prepared the community for their study, mappeds the area and, together with Ministry of Health technicians, searched for the snails in their expected habitat and diagnosed the infected ones. Next they examined urine and stool samples from all the available inhabitants, interviewed the infected ones and examined them under supervision of their tutors, and referred seriously sick ones to the hospital. They analysed and interpreted their data, discussed them with each other, filed a written report which they discussed with their Faculty and M.O.H. Supervisors. They reported that the canals were infested with infected snails and that Bedouin inhabitants who have never crossed to the Nile Valley were already infected and never treated. They prepared a program of health education which they conducted while distributing the specific anti-shistosomal drug to the patients. They studied and discussed with the health autrhorities the recommended preventive measures to prevent transmission of infected snails in the current and prospective irrigation schemes.

PROBLEM No. 8 : Where should students learn :

Basically CBE can be conducted wherever people live and work. In the Faculty of Medicine at Suez Canal University around 25 sites are being used for regular field training. These are mostly rural and urban health centers but also include General Hospitals, infectious disease Hospitals and Health Insurance Clinics. But CBE activities also include projects such as community surveys, community diagnosis and action plans that would be conducted in households, factories, a whole village or urban sector or on representative sample of the population.

The factors to consider in the definition and selection of the sites or setting of CBE activities are many and include:

- Relevance of the learning experiences to be gained in this site to the educational objectives of the particular phase of the curriculum.
- Feasibility of organising the CBE activity : The factors to be considered here include: collaboration of the local health service personnel and of the community itself, available facilities, accessibility, logistics, cost of transportation, accommodation etc. ...
- The need of the local community for service.

The proportionate exposure to the various levels of care, primary, secondary and tertiary, as a function of the competencies that need to be acquired. In this context the "Natural History of Health Problems" approach[10] could be helpful. Students could be given supervised responsibility of groups of patients and families from a given community. Under close supervision of their teachers, students could base their learning activity first at the level of the whole assigned population, then at the level of those who come into contact with health care in an ambulatory service, then those who are admitted at least once to a Hospital (10%) and finally to the 1% who are admitted to a University tertiary care Hospital.

In this way the types of health problems confronting a given community can determine the types of training settings.

PROBLEM No. 9 : A new role for teachers :

Teachers of community-based educational programmes, particularly those adopting problem-based learning which have different tasks to perform, unfamiliar to their colleagues working in conventional discipline-oriented teacher-centered programmes.

•**Teaching :** Rather than actively teaching, it is the students who are actively learning. The teacher's role is to plan the educational activities, make the learning resources available to students, Supervise and facilitate the learning process as a class — or field-tutor — and evaluate the students. Other educational activities include the training of health personnel on educational methods and the upgrading of their professional skills. Teachers need to be trained for these new functions.

•**Service :** Instead of confining their practice to Tertiary Care Hospitals, in which they are comfortable, they must also extend their servicers to primary care sites and share the same practice environment with regular health service personnel.

•**Research :** Educational and administrative activities often compete with research to occupy the time of faculty members, leaving little time for the latter. Faculty members may be frustrated because they need to do research for their academic satisfaction and career development.

•**Administration :** Many new jobs appear on the organizational chart of community-based institutions. They are needed to run the extensive outdoor community-based field activities; such jobs can usually be performed only by faculty members.

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Hence recruitment and retention of faculty in CBE programmes could be a major problem that threatens the quality or even survival of the programme.

Every effort should be made to involve suitable non-faculty health personnel to partake in students' training and supervision. Their "teaching" abilities could be enhanced by joining the "tutor training workshops" offered to the regular faculty. Many of them can be stimulated by the presence of students to resume or join postgraduate courses to freshen and upgrade their professional skills. The Medical School should encourage, facilitate and open such opportunities to health personnel. This not only facilitates students' learning but also serves as a means of upgrading health delivery through CBE.

Our experience has shown that it takes a few years of teaching problems and growing pains before a steady state is reached when the Faculty becomes comfortable with their mastery and control of the educational process. Their comfort is augmented by their satisfaction with their fine product namely, their students. They also discover that they do have time and opportunity for more fascinating research in which they join in multidisciplinary teams, often including their students to address fundamental community health problems.

PROBLEM 10 : Management and Organization

The administrative system and organizational structure of an Institution adopting CBE needs to be adapted to the peculiar needs of the programme.

- Mention has already been made of the need to establish a functioning stable relationship with the health service sector. This has its administrative and financial implications.

- To coordinate and integrate educational, service and research activities of the Institution and direct their movement towards the Institutional goals. A matrix structure may need to be developed in which the Departments would follow the vertical axis and the Committees the horizontal one. It is particularly crucial to avoid a conflicting authority of Deaprtments and Committees. The friction could be damaging and the whole process and output would suffer.

- Students, and Faculty, community-based activities need an appropriate management system which guarantees adequate control and flow of information and the provision of support services at the proper time in the proper place.

- The logistics of providing transport, accommodation, sometimes small libraries and various materials required for the educational process in several places scattered over wide and sometimes remote areas, and the required funds pose management problems to be solved. Each institution should find out how best to manage the operation of its programme within the available resources. At present there are no universal recommendations that can be adopted everywhere. .However whatever the system a valid and affordable program evaluation mechanism should be built into the system from the very beginning.

WORKING TOGETHER TO SOLVE THE PROBLEMS

The problems of implementation of a CBE curriculum are challenging, and are highlighted by the magnitude and dedication of the efforts required of us to add relevance, and value to our profession as Physicians and Educators to better serve the needs, and expectations of our Communities.

It is comforting to know that the CBE movement is steadily growing (here at the School of Medical Sciences, (USM) and also all over the world as witnessed by the growing number of member institutions of the NETWORK. We have to accept the growing pains as a natural phenomenan. The NETWORK has launched seven Task Forces which are addressing the major current problems in CBE that call urgently for research and exchange of experience. The future seems promising with HEALTH FOR ALL. Let's work together to accelerate the process.

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PHARMACOLOGY IN AN INTEGRATED TEACHING CURRICULUM FOR UNDERGRADUATE STUDENTS AT THE SCHOOL OF MEDICAL SCIENCES, U.S.M.

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Introduction

Many medical schools in the Asiatic Sub-continent utilize the traditional method of medical education to train medical students; recently, however, medical undergraduate training in the region has placed major emphasis on the acquisition of knowledge and skills which stimulate and encourage independent and problem-based learning. This approach is designed to facilitate the active participation of students in obtaining, and analysing information which will enable graduates to optimally serve their communities, and at the same time facilitate their postgraduate and continuing medical education. This integrated method of teaching medical undergraduates has been utilized by the School of Medical Sciences, University Science Malaysia, Penang, Malaysia, since it was established in July 1979.

The School is community oriented and its main goals are to promote:-

1) an understanding of the scientific basis of Medicine.
2) a satisfactory standard of clinical competence.
3) an awareness of the broader role and responsibilities of medicine as a profession in society, and
4) the development of attitudes to ensure continuing self-education and self-evaluation.

The Integrated Curriculum

In agreement with the School's Philosophy each discipline, including Pharmacology, has adopted a problem-based strategy and has organized its curriculum content around organ systems and patient problems.

Pharmacology is taught in all the 3 Phases of the five years of the undergraduate medical curriculum, and the implementation of course material which is listed below, should be considered in this context.

Phase I: Year I

Phase I of the medical curriculum is designed to lay the foundation and provide a continuum for the study of organ-system/patient-oriented activities to be taken in Phase II: (Years 2 and 3) of the medical programme.

Phase I aims at achieving an understanding of the structure and function of human body, its growth and development, and its responses to injury and the environment (Fig. 1).

COURSE CURRICULUM FOR YEAR I

BASIC FOUNDATYION
CELLS AND TISSUES
GROWTH & DEVELOPMENT
BLOOD
CARDIOVASCULAR SYSTEM
RESPIRATORY SYSTEM
NERVOUS SYSTEM
LOCOMOTOR SYSTEM
DIGESTIVE SYSTEM
NUTRITION
RENAL SYSTEM
ENDOCRINE SYSTEM
REPRODUCTIVE SYSTEM
HOST AND ENVIRONMENT
FIRST AID : NURSING
ELECTIVES

Fig. 1

During the Phase, teaching/learning materials in pharmacology are integrated into the appropriate systems of the course curriculum to provide basic concepts of relevance to the understanding of Pharmacology. For example:-

1. Membrane and receptors are integrated with the cell and Tissue System.
2. Pharmacokinetics, Pharmacodynamics and drug interactions are integrated with the Digestive and Renal Systems.
3. Drugs affecting the autonomic nervous system are integrated with the Nervous and Endocrine Systems.

Phase II: Years 2 and 3

The Phase II curriculum is presented in organ-system blocks (e.g. the Cardiovascular Block Fig. II). These are problem-based, and require students to integrate basic sciences with clinical information and relevant data-gathering skills. A total of 12 blocks encompass approximately 60 problems and in each block there are varying degrees of input from the discipline of pharmacology. The "Cardiovascular System Block" (agreed upon by the Phase Curriculum Committee) presents five problems with areas of major emphasis for each

problem, and the relevant pharmacology input. This is designed to enable students to acquire knowledge on the actions and effects of drugs used in this block.

BLOCK : CARDIOVASCULAR SYSTEM

Week	Problem	Area of Major Emphasis	Pharmacology Input
I	A boy with bluish discoloration	Congenital heart disease	Sympathomimetic amines, and their antagonists. Adrenergic receptor interaction
II	Technician referred to the Medical Officer for fitness assessment	Hypertension	Antihypertensive agents, and Diuretics.
III	Pain in chest	Angina Pectoris Arrhythmias Myocardial infarction	Anti-anginal agents; Antiarrhythmic drugs; Calcium-ion antagonists Beta-adrenergic blockers.
IV	Breathlessness on Exertion	Valvular Diseases Congestive cardiac failure	Digitalis & related Cardiac Glycosides
V	Pain in leg	Peripheral Vascular Diseases	Drugs used in treatment of Hyperlipoproteinaemias Vasodilators

Fig. II

Phase III: Years 4 & 5

In the 4th and 5th years, emphasis is placed on bed-side teaching of Clinical Pharmacology and Therapeutics. Students now learn to apply their knowledge to the practical use of drugs as therapeutic agents. Students are taught that pharmacological agents should only be administeres to patients when the potential benefits clearly outweigh the potential risks; they are encouraged to be constantly concerned about drug interactions and adverse drug reactions, and cautioned about the misuse and abuse of all drugs, particularly psychoactive agents.

Comment

The design of the Curriculum in Pharmacology in the integrated setting of the USM Medical School places emphasis on the training of doctors who, hopefully, will be rational users of medicinal preparations in the best interest of their patients. In this context, the School has adopted a problem-based strategy and

has organised its curriculum content from Phase I to include organ-systems and case studies, so that the students can continue to develop and enlarge their understanding of appropriate and inappropriate drug use. To what extent has this approach been successful? The first group of students have just graduated (June 1986) and at present it is still too early to provide unequivocal answers to these questions. However, certain emerging trends are of interest since they provide opportunities for appropriate remedial action. Some students have suggested that more emphasis be placed on the mechanisms of drug interactions and drug-induced adverse reactions, particularly as they relate to the overall management of patients. In this regard, most of the present staff who have been trained in traditional medical schools are now in the process of adapting their competences to problem-based learning and to implementation of the "SPIRAL CURRICULUM" in which Pharmacology given at an earlier phase is re-enforced, up-dated and integrated more fully into the teaching and learning materials of the later phases. The therapeutic principle of trying to make the treatment fit the patient is stressed, and is of fundamental importance to effective drug therapy.

In addition, every effort is being made to ensure that the students and graduates acquire the skills, competences and attitudes needed to carry out their professional duties and responsibilities as effectively and efficiently as possible.

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COMMUNITY HEALTH CARE IN MEDICAL EDUCATION

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Introduction

One objective of the Medical School, Universiti Sains Malaysia (USM) is to prepare graduates who will be willing to undertake work outside the hospital system, and who can accept the community as their base for delivering health care. They are in a position to do this because the alternative has been defined during the educational process.

The Community and Family Case Studies (CFCS) programme enunciates the response to fulfil this objective. CFCS has been conceived as experiential learning, where life situations highlight factors to be considered, when addressing issues in health. These experiences are planned to take place among ordinary people who are not necessarily ill.

Initiated originally as studies of families with a specific Maternal and Child Health (MCH) focus, an almost immediate re-examination of the concept was necessitated, because of lack of student response initially. The reformulation that has been undertaken, has expanded community components, has varied student activities and has required participation in more than MCH studies. A clear progression of tasks, reflective of growing responsibility during the five years of medical education, is seen as essential to gain student interest.

Programme

CFCS follows the established pattern of Phases I, II and III in the USM Medical School.

Phase I is preparatory in nature. The Behavioral Science inputs which represent the basic requirements for work in the community, are provided by the Growth and Development, and the Host and Environment packages in Year I of the curriculum. Biostatistics and Epidemiology introduced at this juncture also serve as pre-requisites for subsequent surveys and analysis of data, in the following phases. There is only one opportunity at this stage, for students to go out into the field and this is in conjunction with the study of human development, when visits are made to available institutions.

Phase II incorporates the second and third years of study. Student involvement in the community begins here, and four packages with a definite sequence in each of the two years, make this phase a busy time for students.

The Second Year begins with a Demographic Study of a selected community and this is followed by identification of Health Resources, inclusive of traditional practitioners and facilities, within the chosen community. The next

step is a survey of Nutrition and Infection, mainly that of the children in the host community. The final activity for this year is a Health Education Project organised by students, based on the results of their studies, in a particular community.

It is necessary to mention here that while most of the activities are by groups of students, opportunity to work at a close personal level is provided through an on-going study throughout the year of selected families, on a student pair basis, after the first package.

During the Third Year the focus shifts from the larger community to specific target groups. The packages for the year are Maternal & Child Health, School Health, Occupational & Environmental Health and finally a study of the Elderly. Again students work in groups, but closer contact is established between a pair of students and one family each, when they select a mother for study under the MCH package. This involves on-going contact for approximately 8 months.

Phase III consists of Years 4 and 5 where closer contact between students and patients provides the entry for students to move into the community. Students now work independently and select two patients, one from each of the major rotations (Medical and Surgical) for long term study until they complete the first six months of Year 5. In this final period of CFCS activity students are exposed to the implications of illness, the effect on individuals, the impact on families and the wider response from the community.

This then in summary, is the CFCS programme as it is being implemented at present. The time allocation for CFCS is two mornings a week in Phase II and one afternoon a week in Phase III. In the beginning, the students get to know selected communities; they then move through a series of supervised activities and the programme culminates in holistic medical care, where cognisance of life outside the hospital is taken into account.

In the process, students learn to accept responsibility for individuals and families, to improve the health of the community they adopt, to develop positive attitudes towards health and illness and gain insights into family life. Effective communication becomes important, not only among peers, since they function in groups, but also in their contact with lay people. They also learn to negotiate with people in positions of authority in the community in order to facilitate and implement action of their studies and projects. It becomes clear that clinical expertise alone is not adequate to enhance community health.

Comment

The inclusion of a programme like CFCS in a medical curriculum is easier to conceptualise than to implement. Several factors have to be taken into account and the three most pertinent namely acceptance, relevance and assessment are discussed.

Acceptance

Policy decisions alone do not gaurantee acceptance; but acceptance is central to the success of a programme such as CFCS. In this respect two perspectives are considered, namely those of the students as well as those of the staff.

The Biomedical model of medicine is what is most familiar to students enterning medical school. When faced with new tasks seemingly far removed from developing diagnostic and treatment skills, resistance to such novel activities can be expected. Experiences geared to capture student imagination and those which encourage the exploration of their wider role, can help overcome resistance. In addition, responsibility for tasks has to be assigned to students if they are to invest themselves in planned activities.

Staff responsibility within CFCS relate to the supervision of students and the implementation of any one of the packagers in the programme. Both are time consuming. Taken against the regular demands of teaching, clinics and research, few staff are available to play their full role in CFCS. There are also those who feel that CFCS time is at the expense of other aspects of the curriculum. Students learn as much from such demonstration of attitudes as they do from what is directly taught them. Any inability or reluctance of staff is taken as a lack of importance of the programme, and students may not give the CFCS programme the attention it deserves. The solution lies in selecting staff who are genuinely interested. Of equal importance is the need to acknowledge staff contribution within CFCS. Staff cannot be effective in CFCS if they have very heavy commitments in other areas as well.

Relevance

The second factor that bears examination is that of relevance; this is the other face of the coin, as far as student acceptance of the programme is concerned.

In developing packages, which are within the competence of students to implement in the community, thought has to go into linking these to the general rotations they are engaged in. Wherever possible, the content has to be integrated in order to re-affirm the relevance and also to demonstrate that CFCS is not just grafted on. CFCS packages can be preparation for a rotation yet to be run, or revision for ground already covered. Where it is possible to link its content directly to a current rotation the question of relevance poses no problems and students are easily engaged.

There are also opportunities in CFCS for students to put into practice laboratory and clinical skills during the course of field activities.

Assessment

The third important factor, perhaps the most crucial to students, is the matter of assessment. Student response to the programme is to a large extent governed by whether performance in CFCS is accounted for and does contribute towards academic status, as progression in made through the

years. In this there is some difficulty, because all aspects of the programme do not readily lend themselves to normal assessment procedures.

The knowledge components are currently subjected to the usual assessment procedures used in the Medical School. Group, pair and individual study efforts reflected in the end-of-assignment reports and presentations can be marked. It is however the intangible areas of helping to change attitudes, building of relationships and being able to negotiate with people in matters of health, that there is difficulty. Until supervisor assessments can be made as objectively as possible the weightage assigned to this aspect cannot be high. It is here that a dilemma exists. A low weightage usually signals less importance and this is not exactly correct as far as CFCS is concerned. The basic problem relates to attempts to standardise assessment procedures in a programme that is so different from the usual academic subjects.

Conclusion

CFCS has evolved as a clear teaching/learning activity at the USM, Medical School. It is apparent that certain aspects have to be strengthened, if it is to serve as valid experience for making a choice between hospital and community health care. The relevance of planned activities is understandably less clear to students than to staff and more work is needed to develop student interest and enthusiasm. A more conscious pooling of resources from the School as a whole can make the programme more viable and acceptable.

TEACHING/LEARNING METHODS

THE VARIOUS METHODS OF TEACHING AND THEIR IMPACT ON STUDENTS

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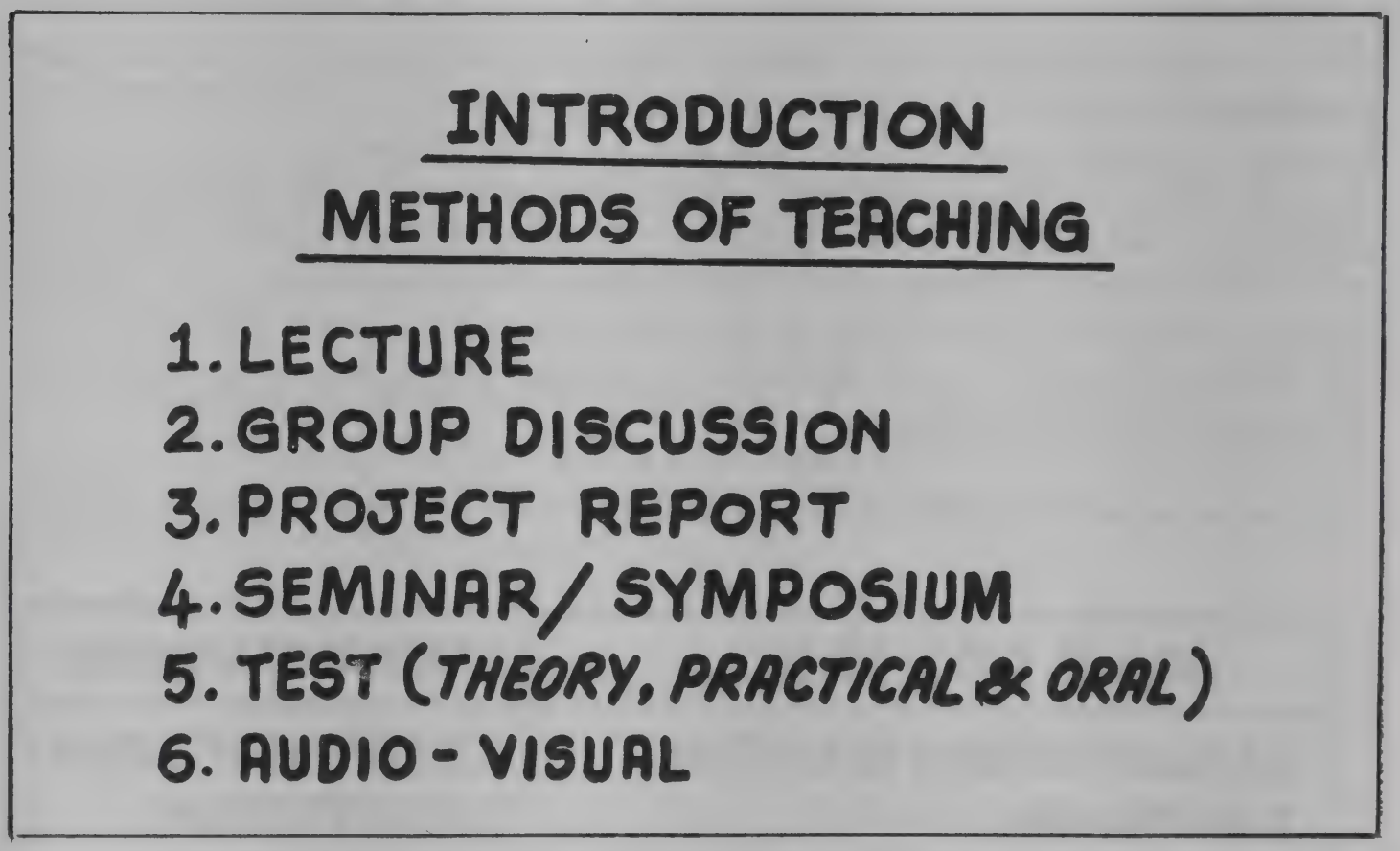
INTRODUCTION

The methods of teaching vary according to the mental calibre of the students. The commonplace methods are: (1) the lecture methods, (2) group discussion, (3) extracting project reports, (4) conduct of seminars/symposia, (5) conduct of periodical written, practical and oral tests and (6) demonstrative lectures/ audio-visual methods.



Generally, the student prefers the lecture method, as he gets all the information required. The seasoned teacher delivers his goods after a thorough mastery over his subject. An inexperienced, ill-equipped teacher finds himself miserable in the class. The responsive student makes much use of the well delivered lectures; the weaker student is at a loss as he neither take down points from the lectures nor is he willing to clear his doubts. Because of shyness, language debility and poor grasp of the subject, such students feel comfortable in their seats. The draw-back of this method is that the stuident does not learn by himself.

LECTURE METHOD

TEACHER	STUDENT'S RESPONSE	
	BRIGHT	DULL
1. WELL EQUIPPED	+++	+
2. ILL EQUIPPED	-	—

DRAWBACK: STUDENT DOES NOT LEARN BY HIMSELF

With a view to enlighten such students the group discussion method has been introduced. In this method, the weaker ones getting rid of their inhibition and shyness, voluntarily raise their doubt and get them cleared. Group discussion also develops the communicative ability, understanding the subject in the proper perspective and it also promotes togetherness and understanding of each other, thereby curbing the unrest among the students which has been a national menace causing havoc to the educational curriculam. The success of this method depends purely upon the spirit and well-meaning in which it is conducted and participated.

GROUP DISCUSSION	SYMPOSIUM/SEMINAR
1. ENLIGHTENMENT OF LECTURE 2. IMPROVES : (A) UNDERSTANDING OF SUBJECT (B) COMMUNICATIVE ABILITY 3. PROMOTES UNITY	4. EXCHANGE OF VIEWS 5. PENETRATION 6. LEADERSHIP

CAUTION: TASTE THE SPIRIT BEFORE GULPING

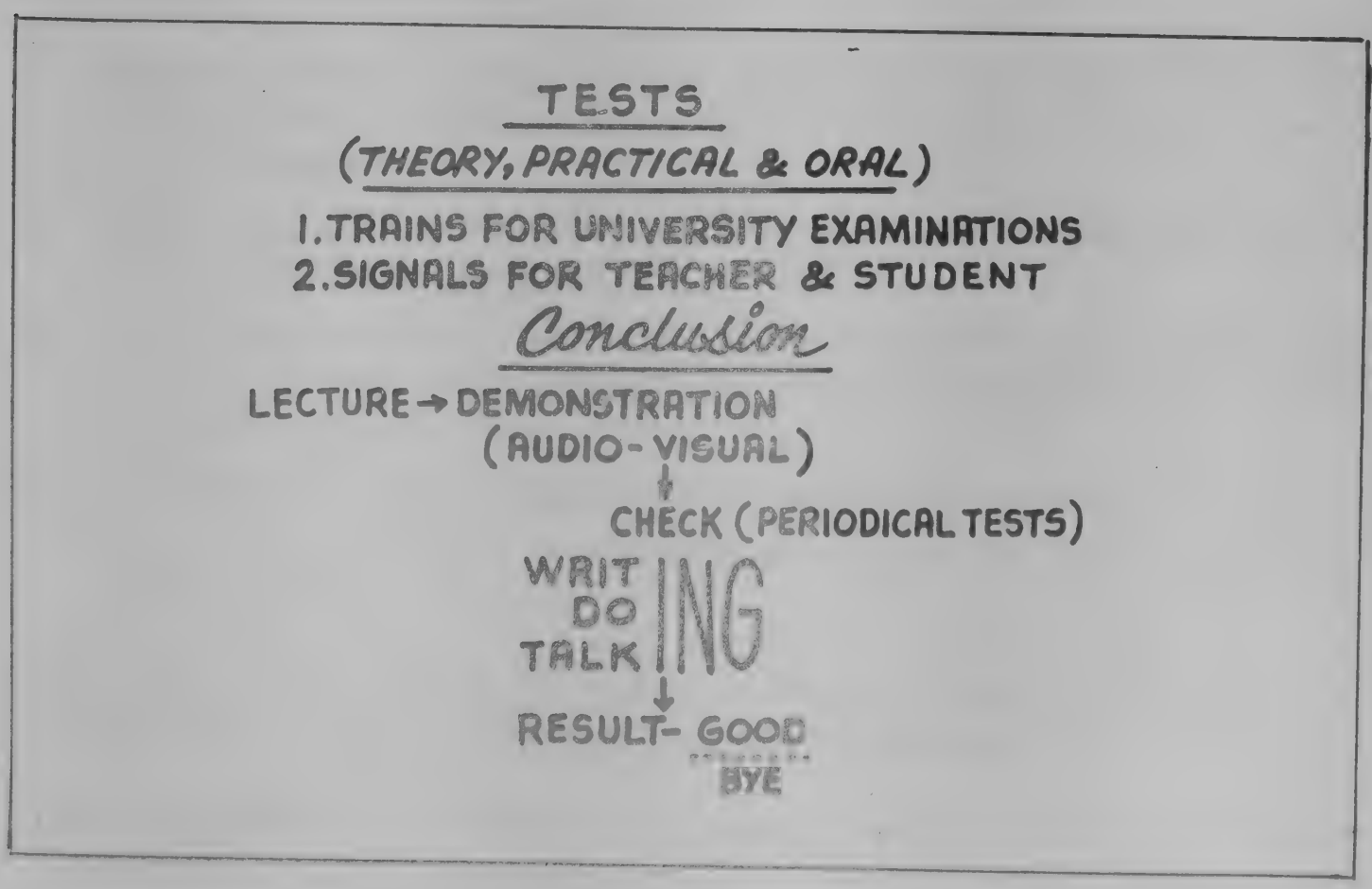
The conduct of Seminar and Symposium also develops the same talent as seen in group discussion. The distinguishing merits of seminar and symposium are (1) exchange of views and plumbing into the depths of the subject matter and (2) development of leadership qualities.

The individual project report provides scope for the students to have their choice of topic, makes them collect the relevant materials, weigh them and come out with their original contribution. The project reports really help them to do researches in future, which is needed very much in any developing country.

PROJECT REPORT	DEMONSTRATION / AUDIO - VISUAL
1. CREATIVE *(TRUTH)* 2. EXTENSION *(KNOWLEDGE)* 3. SCIENTIFIC PROMOTION	1. FACT 2. EASY CATCH 3. CATCH LASTS LONG 4. NO HEADACHE

Demonstrative lectures and audio-visual programmes play a vital role in imparting knowledge visually. The students grasp things easily without straining their heads because anything that is seen keenly could not be forgotten easily.

The conduct of periodical tests in theory, practical and oral helps the students prepare themselves for the University examinations. It also helps to assess the merits of the students in their preparation for the examination as well as the teachers in their methods of teaching.



Conclusion

The lecture followed by demonstration/audio-visual programmes and conduct of periodical tests in theory, practical and oral has proved to be the best successful method to mould "tomorrow's physicians, today."

FIXED LEARNING MODULE (FLM) A TEACHING -LEARNING METHOD

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The curriculum adopted by the Medical School at Universiti Sains Malaysia provides an opportunity for innovative promotion of teaching and learning. The integrated system-based teaching programme of Phase II is implemented via a variety of teaching-learning methods and FLM forms an integral part of its problem based approach to learning (PBL).

The modules are prepared by staff members and displayed in the multi-disciplinary laboratory during the teaching programme.,

There are numerous ways in which a module can be presented, using various audio-visual aids, a little imagination and innovation — a variety of presentation format has been achieved.

They are created to support the programme, bridge the gaps in the PBL, link clinical teaching with problem based learning session.

The fixed learning modules for a particular week include modules from various disciplines ensuring integration. The following criteria was kept in mind while preparing the learning modules.

1. Module should provide relevant information with clear instructions to the student to let them know what is expected of them and how to use the module.
2. There must be a self-assessment component built in the module with provision for instant feedback.
3. With clear and explicit instruction (as in 1) students should be able to interact with the module without requiring the presence of a tutor thereby promoting active learning.
4. Modules must ensure integration between discipline and block systems.
5. The various disciplines should provide reference in order to motivate further reading.

The 5 week programme of the endocrine block included pituitary, hypothalamus, thyroid, Endocrine pancreas, adrenal and parathyroid.

For each of these areas, modules were prepared and displayed in the MDL for a whole week so that students could come and use the module whenever they

are free and learn at their own pace. During the FLM session, besides active discussions taking place among students, we found them formulating their own answer to the question in the modules before checking with the answer provided, exhibiting active feedback enhanced learning.

To find out the attitude of the students towards the learning modules of the Endocrine Block, 2 sets of questionaire based on Likert scale and Osgood semantic differential were distributed.

With a mid point score of 65 for the Likert scale, 100% of the respondents have a positive attitude towards learning modules. 100% of the students also give a positive attitude score when using the Osgood scale, which has a mid point score of 32.5. When both attitude scales were plotted against each other, all respondents (100%) have a positive attitude score towards the learning modules of the Endocrine block.

FLMs are useful to:

(a) produce multidisciplinary integration

(b) correlate facts learnt in uifferent blocks

(c) highlight the *SPICES philosophy of the school

(d) support problem based approach to learning

(e) emphasise the *spiral curriculum

It is a student centered activity with emphasis on **self learning**.

To generate active self learning, well prepared modules and optimum student motivation towards self learning are essential.

* SPICES stands for

S — student centered
P — problem based
I — integrated
C — community based
E — elective
S — system based

Spiral Curriculum — vertical and horizontal integration

A REAPPRAISAL OF THE TEACHING-LEARNING METHODS USED IN THE UNIVERSITI SAINS MALAYSIA SCHOOL OF MEDICAL SCIENCES IN TERMS OF FULFILLMENT OF ITS OBJECTIVES

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INTRODUCTION:

World Health Organisation's policy, "Health for All by the Year 2000" has posed new challenges to the medical educators. Preparation of "Competent" doctors for primary health care; development of an integrated community orientated problem centred curriculum relevant to the community and the region; inculcation of appropriate values, positive and humanistic attitudes in the doctors; emphasis on the new role of the doctor as a leader and manager of the heralth care team etc. etc. are some of these challenges.

In 1979, the newly established School of Medical Sciences of the Universiti Sains Malaysia, Penang took a giant leap forward into the future by adopting an innovative curriculum for its undergraduate programme with specific objectives of "producing competent practitioner who would be able to identify himself as part and parcel of the health-care team and the 'Rakyat'. (Roslani, 1980).

Seven years later and five years after the first enrolment of the students, the first batch of "doctors" have graduated. It is therefore time to relook at the programme as a whole and the teaching learning methodology to evaluate their appropriateness in the fulfillment of the objective stated above. This paper discusses the rationale behind the adoption and modification of the various methods used in the school during the past five years. Specific evaluation of individual technique is in progress and beyond the scope of this paper.

THE CURRICULUM MODEL

The Teaching-learning methods have been adapted to reflect the curricular design which can be summarised in the word:

S	—	Student centred
P	—	Problem based
I	—	Integrated
C	—	Community Orientated
E	—	Electives
S	—	Systematic

The entire curriculum has been logically divided into 3 phases and the learning approaches vary accordingly as mentioned below:

Curriculum	Learning approach
Phase I (Year 1)	Fairly didactic system but at a general level, using multidisciplinary approach.
Phase II (Year 2 & 3)	Problem based learning on the basis of integrated multidisciplinary organ-system approach.
Phase III (Year 4 & 5)	Holistic approach to the individual as well as the community where facts and principles learnt in the earlier phases are consolidated.

There is gradual transition from the didactic approach in phase I to problem based learning in phase II and problem solving exercises in phase III, although 'mini-problems' and structured learning exercises ate introduced in phase I itself. Community orientation is ensured through the community and family case study (CFCS) programme that runs across the phases from Year 2 to Year 5. The curriculum is thus designed to cement effective integration between theoretical knowledge and practical training.

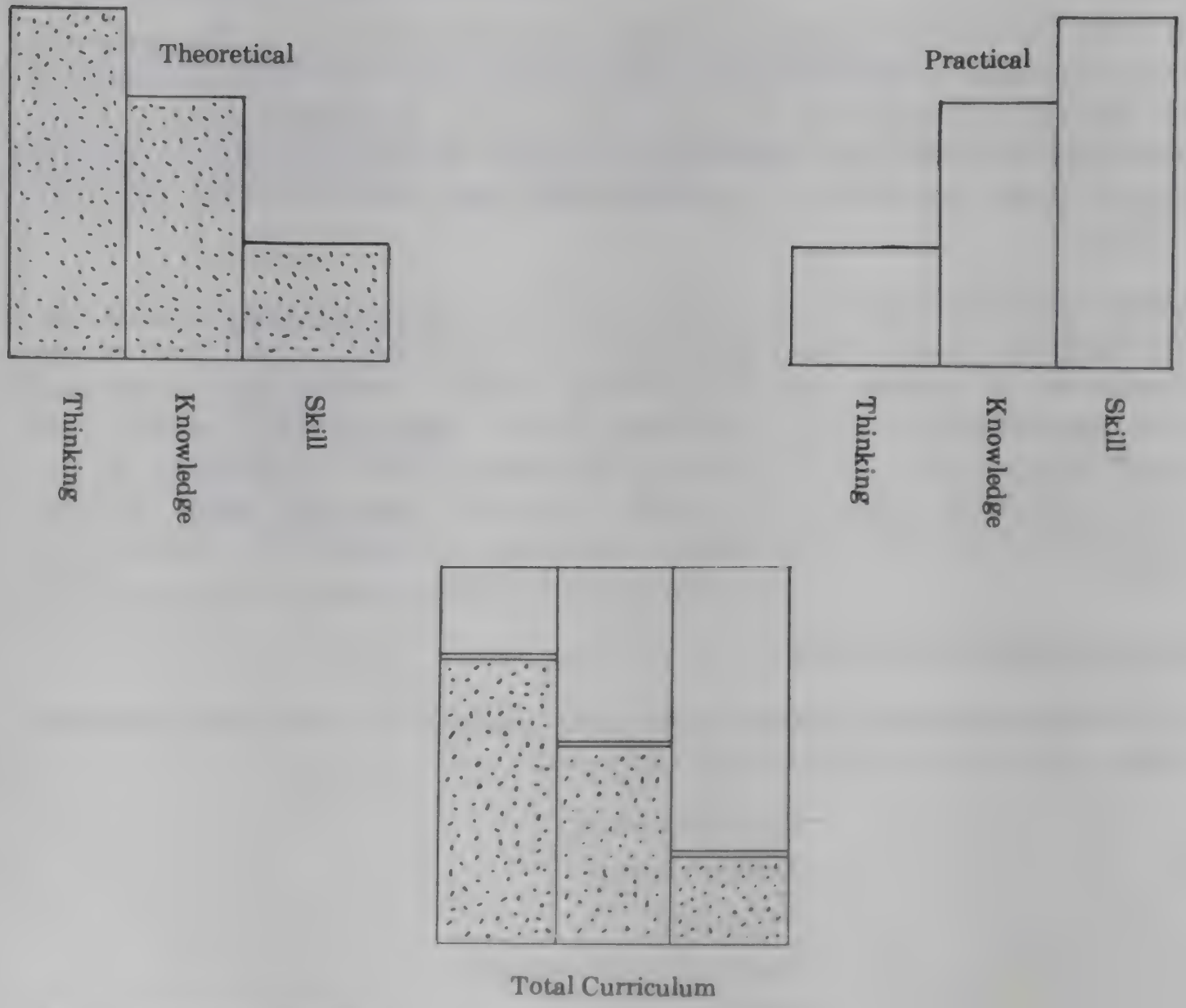

Fig. 1 : Curriculum Planning.

OBJECTIVES:

As a first step to the selection and implementation of appropriate teaching-learning method, the faculty has identified the objectives for each of the programme packages through considerable deliberations. While developing the objectives, the following model has been constantly kept in mind.

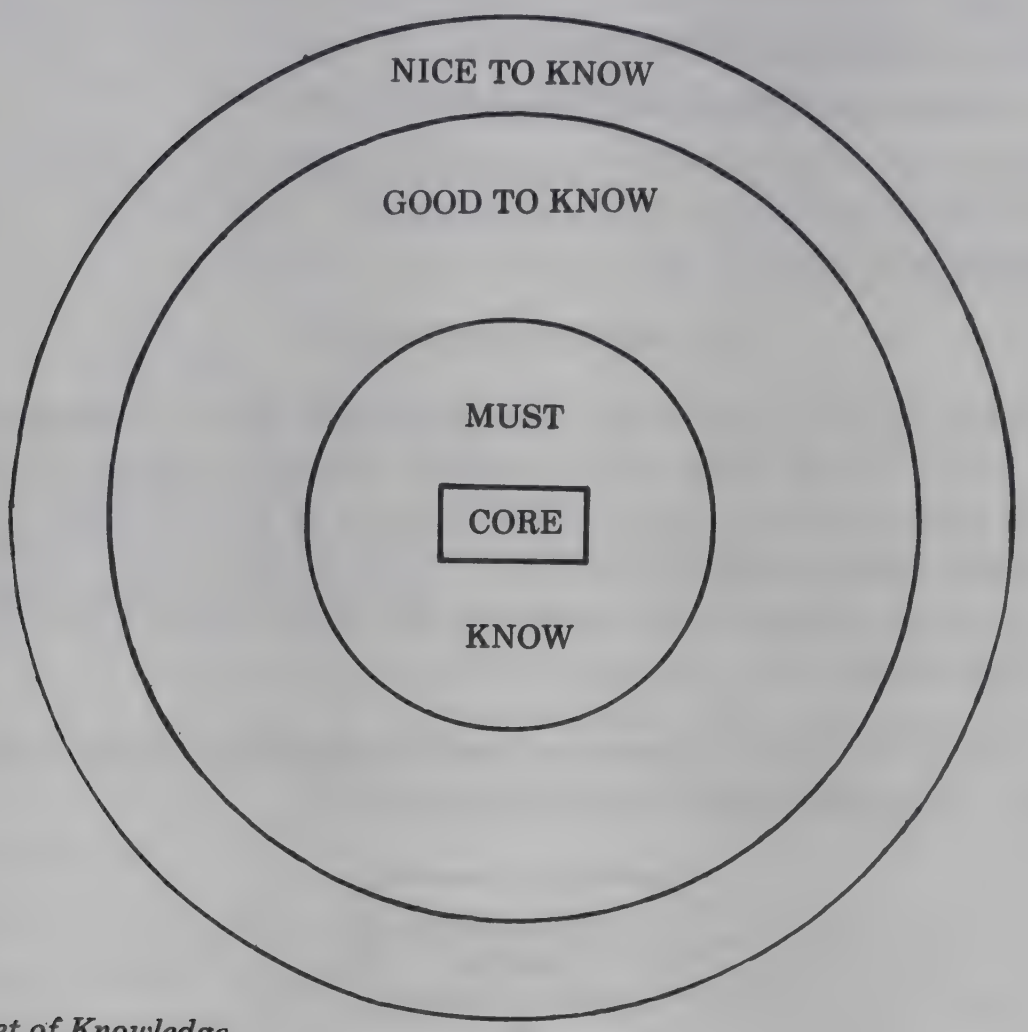

Fig. 2 : Target of Knowledge

The objectives are therefore largely general and incorporate the core contents. This is illustrated through following examples. One of the objectives from the Hemopoietic system-block in phase II reads like this:

The student should be able to: .....

16. *Describe the causes, inheritance, mechanism, clinical and hematological features of:*

    a] *hemophilia A and B,*

    b] *von Willebrand's disease: .....*

Other causes of "hereditary coagulation defects" therefore come under the peripheral zones of the above model.

During implementation it is decided whether the above objective will be fulfilled through a lecture or small group discussion of problem-trigger or by selfstudy from the prescribed learning materials and so on.

The objectives also define the specific skills (whether clinical or laboratory) to be gained through the programme. For example another objective in the same Hemopoietic system block reads as follows:

The student should be able to: .....

7. *Perform the following laboratory techniques:*

   7.1 prepare, stain and examine under the microscope peripheral blood smears.

   7.2 estimate hemoglobin concentration in the blood.

   7.3 estimate packed cell volume.

   7.4 perform a differential leucocyte count.

   etc. etc. .....

METHODOLOGY:

"A MIXED ECONOMY"

With the background information that Universiti Sains Malaysia School of Medical Sciences have adopted a problem centred integrated curriculum, many of the external examiners as well as some of the medical educationists anticipated the programme to be similar to that of either McMaster, New Castle (Australia), or Maastricht programme and were surprised to find it different and probably unique.

Figure 3 outlines the major patterns of teaching learning sessions in the school and the role of teacher-student interaction in each.

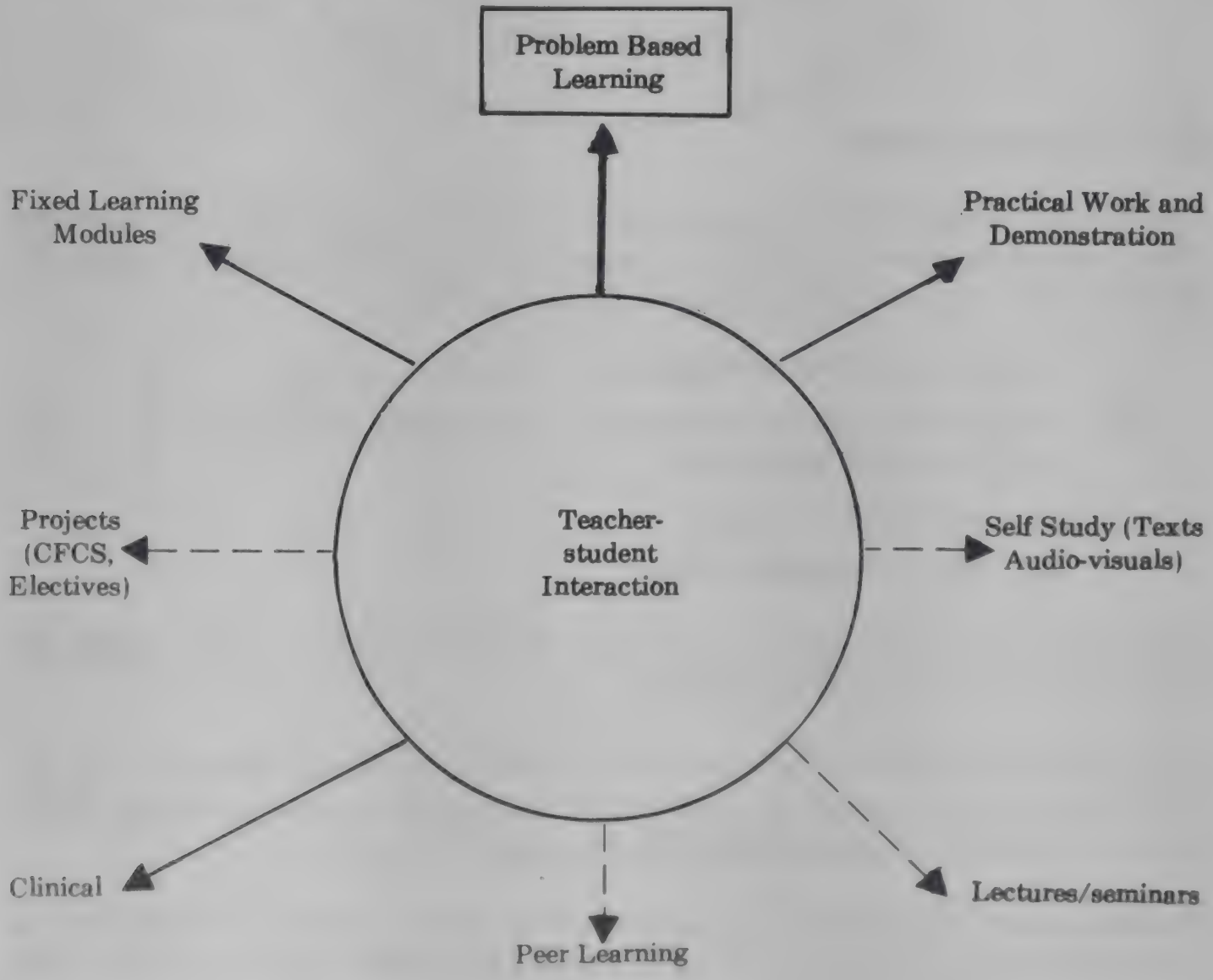

Fig. 3 : Patterns of teaching learning methods.

Several local factors affecting the students, teachers and the institution alike have been taken into consideration before adopting such a system. These can be summarised as follows:

A. Student factors:

1. Our students enter the medical school after many years of didactic system of learning in the schools and therefore develop serious insecurity when confronted with student centred learning.
2. To reflect the National Economic Policy in higher education, students are selected from the different sections of the community on the basis of allocation. As a result three groups of students can be identified:

   Above average

   Average

   Slow learners

   Whichever programme is adopted therefore must cater suitably to the needs of these groups.
3. Most of the students had their primary and secondary education in local medium of instruction while the available text books in medicine are in English.

B. Teacher factor:

More than 2/3rd of the teachers are expatriates coming from "Traditional Medical Schools" and have considerable difficulty in adjusting to the innovative system.

C. Logistic factors:

Location of the Medical School at Penang and Kubang Kerian, Kota Bahru has split the staff strength to half and resulted in acute shortage. The recruitment process is slow.

There is no easy answer to all these problems and no single approach can be deemed as correct approach. The School therefore adopted a "Mixed Economy" in which:

1. problem based learning is the major thrust but not the only means.
2. whole class teaching is used to introduce and sum up the problem as well as to transmit difficult concepts.
3. fixed learning modules are used for individualised learning and self assessment.
4. "specialists" are used as "generalists" also.
5. medical teachers in basic sciences are used for teaching bedside medicine.
6. peer learning is expected to be facilitated by coupling 2nd and 3rd year students in the same programme.

Looking into the programme as a whole one finds that in Phase I didactic teaching constitutes nearly 25% of the teaching time while that in Phase II and Phase III approximately 10% and 5% respectively. On the other hand, the problem based learning (PBL) with its associated individualised learning process involves less than 5% of the teaching time in Phase I while that steadily increases to nearly 60% in phase II and the problem solving exercises and clerkship centering around the hospital based as well as community based patients comprise nearly 90% of the learning time of the students in Phase III.

Whole class teaching is not used for lecture alone but also for role play, student seminars, clinicopathological conferences, student presentation of project works, quiz session, question and answer sessions and so on. Even in the lectures active student participation is planned by deliberate confrontation with questions or problems and monitoring their response either from the show of hands or colour cards. Fixed learning modules (FLM) constitute an important aid for individualised learning at their own pace. Wide varieties of materials ranging from references from the text book or journal to tape slide programmes, video films, prosected specimens, x-ray films, laboratory data etc. are used. For the problem based learning, clinical problems are used to emphasize the relevance of learning basic sciences — a fact which is further reenforced during the bed side teaching by the non-hospital based medical teachers. A clinical problem is selected on the basis of the following criteria:

1. common
2. give access to a maximum number of principles in the basic sciences, clinical and preventive medicine.
3. lend itself to the learning of appropriate clinical skills.
4. demonstrate principles of clinical problem solving.

Discussions on problem triggers usually take place in groups of 15 — 16 students under supervision of one academic staff.

Observations:

Several problems have been faced during implementation of the programme. However these are not unique and existed in other institutions also (Katz and Fullop, 1980; Barrows & Temblyn, 1980). These can be summarised as follows:

1. Overdependence on the objectives-book to fulfill all the objectives through the problem: This makes the problem more and more complex due to deliberate factual overload by the formulators.
2. Stereotyped format: A good number of problems were developed with triggers frequently starting as:

   "A 45 years old Chinese businessman complained of ....."
   The students automatically anticipate what the subsequent discussions are going to be.

3. Tunnel Vision: Relative inexperience on the part of teachers in the develop-

ment of problem triggers sometimes provided materials that cue students to the solution and mostly railroad them to the correct solution.

4. Non-uniformity in the management of the PBL sessions: This is due to confusion over the teachers role in the PBL sessions: "FACILITATOR" or "RESOURCE"!
5. Overly clinical orientation in the development of problems often confined the discussion to the clinical problem-solving exercise rather than the need for development of basic sciences knowledge base.
6. Poor participation in the fixed learning modules if unsupervised.

DISCUSSION

The concept of "Mixed-Economy" appears to be suitable in the local context and is also able to alleviate the students insecurity. Coupling of 2nd and 3rd year students has been found to be most cost effective. Though this practice subjects the 2nd year students to initial handicap, no appreciable difference in the subsequent performance between the 2 groups is noticed.

The problems enumerated above are not unsurmountable and mostly stem from the relative lack of experience of the teachers in the innovative system.

Remedial steps in the form of staff development programme are being organised to overcome these problems. Already following measures have been taken:

1. Relook at the objectives to reduce the overloading.
2. Incorporation of an advanced organiser (Appendix I) as well as pre-test and post-test self evaluation questions in the fixed learning modules. — This has significantly improved the student participation.
3. Introduction of novelties as initial triggers such as newspaper cuttings, laboratory data, referral letters from the practitioners etc.
4. Indegenous development of audio-visual aids.

New concept in the evaluation of the effectiveness of teaching learning methods have been introduced (Harden, 1986). Questions are asked whether a particular methodology fulfills certain criteria.

Figure 4 summarises the various teaching learning methods used in the School of Medical Sciences, Universiti Sains Malaysia that fulfill these criteria.

Figure 4 : Effectiveness of Teaching Learning Methodology.

Criteria	Methodology
Feedback	Questions-Answer sessions, Quiz, Lectures, Questionnaire
Activity	PBL session, FLM Clinical CFCS

Individualised	FLM Self Study sessions.
Relevant	Clinical set-up Community Knowledge base

Conclusion:

Separation of Medical Schools into "traditional" and "innovative" groups is artificial, though innovative methods can always be incorporated into other systems. A "mixed economy" appears to be the appropriate approach in this Medical School under the existing constraints. No Medical School in the world can guarantee production of doctors with all the informations. Aim should therefore be towards producing a competent doctor who knows his efficiency and knows well where to look for help.

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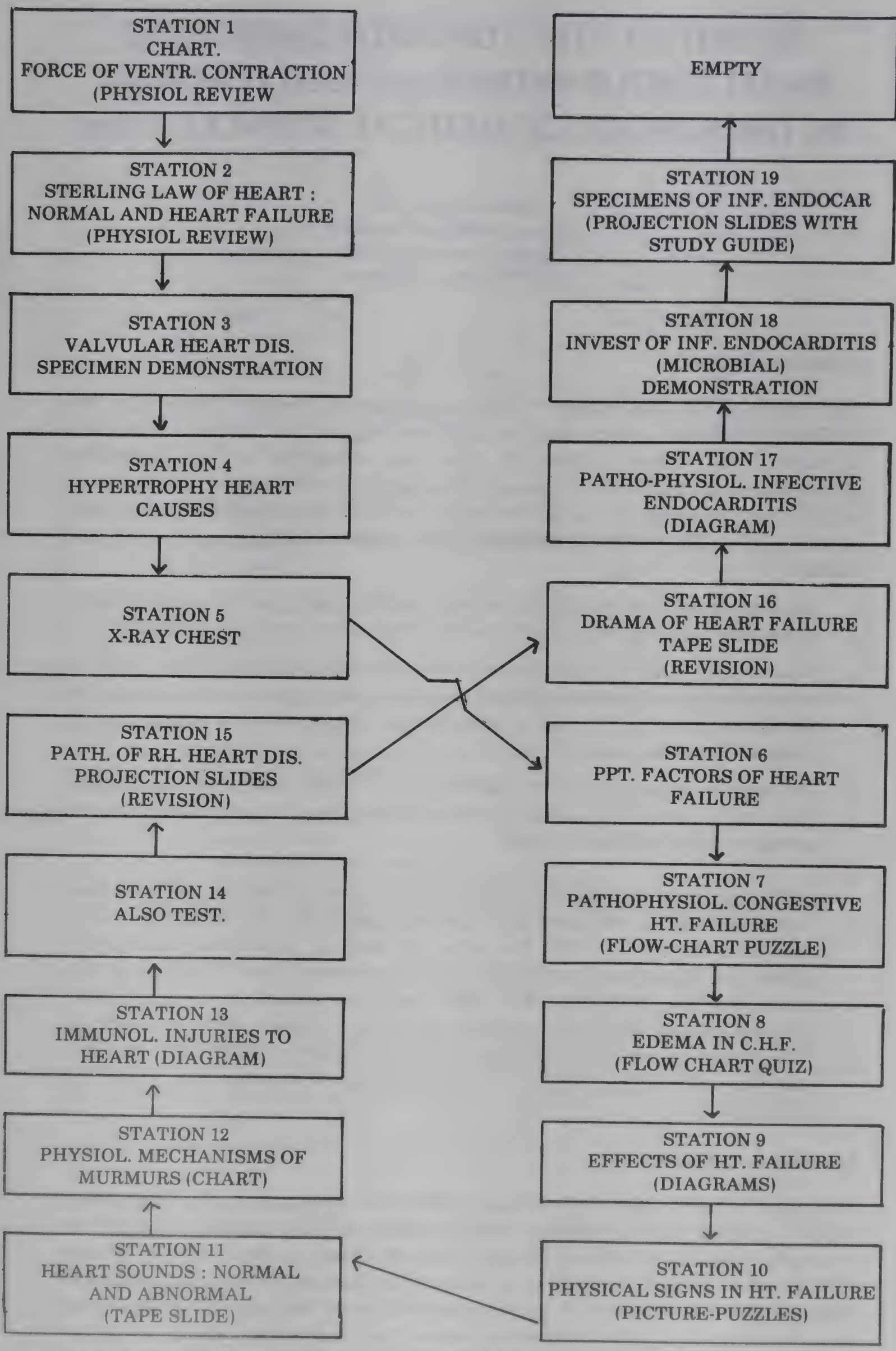

Appendix I : Example of an Advanced Organiser for FLM on Rhematic valvular heart disease.

AN INITIAL STEP TOWARDS IMPROVING SMALL GROUP PROBLEM-BASED LEARNING IN THE SCHOOL OF MEDICAL SCIENCES, USM

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INTRODUCTION

The intention of this paper is basically geared towards improving the 'PROCESS' of small group teaching and learning in the School of Medical Sciences. The Medical School at USM, has embarked on an innovative programme in its instructional design. Small group problem based learning was adopted and accepted by the School with a number of instructional objectives in mind. These objectives are outlined in my abstract to this presentation, and include:

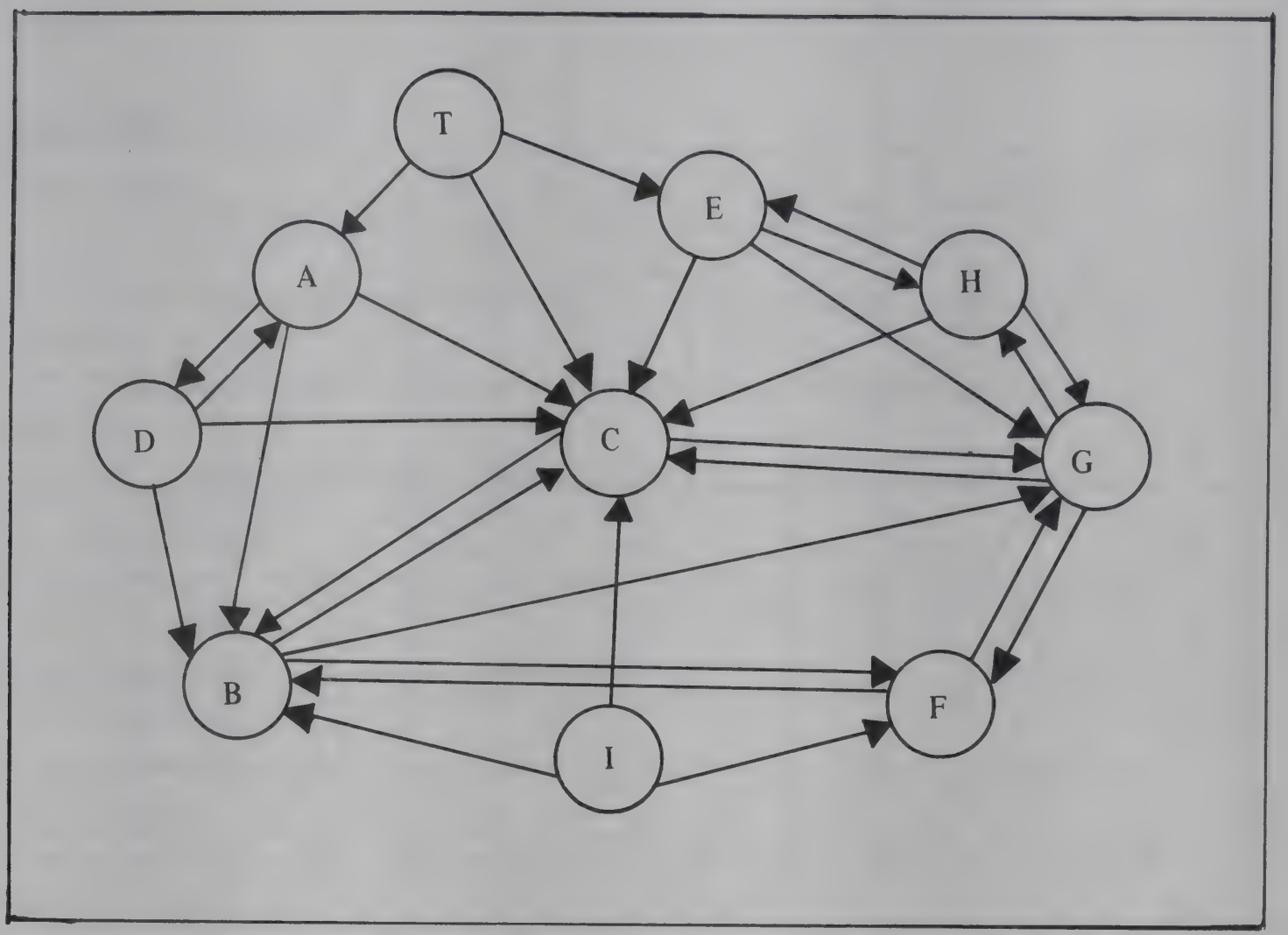
1. To provide an opportunity for active student's participation in the process of problem solving in a situation when immediate feedback is possible;
2. To provide students with opportunities for learning from peers each of whom brings different knowledge and experiences to the group; for communication skills and to encourage cooperative; as contrasted to competitive, learning;
3. To provide opportunities for learning about group interaction and group process that would be useful in understanding how to get the most out of group or team problem solving.

While the 'content' covered during the small group learning sessions have been thoroughly evaluated and assessed during the end of block evaluation sessions and in the formative as well as summative assessment schedules throughout our educational programme, the 'PROCESS' of this same learning experience has often been neglected. As a result mini-lectures prevail and some students and tutors subsequently succumb to this malady as an 'easy way out'. We must however stress that this is a common and early setback in the implementation of small group teaching and learning.

Methods and Results

Therefore, as an initial step to gauge student's participation in these small group sessions and to identify trouble areas in this learning process, an evaluative strategy is offered. Students are observed in their learning groups and patterns as well as choices of interaction between them are monitored through the construction of sociograms and socio matrixes. The sociogram actually demonstrates the patterns of interaction in the small group, while the socio matrix records the choices of this interaction. The figure below shows a

sociogram which was constructed during a 15 minutes discussion in one of the small group sessions observed.



(A) A typical sociogram constructed during a 15-minute discussion in one of the small group sessions:

KEY:
T = Teacher/Tutor
C = Student presenting a resource topic
A, B, D, E, F, G, H, I = other students in the group
(the arrows demonstrate the patterns of interaction between group members).

Objective feedback to students on their performance in the small group learning process can be achieved through analysis and interpretation of these socio matrices and sociograms and discussing the findings with them. This is important because students need to see the significance of this learning process before they can appreciate its importance.

While analysis of student's performance is an important initial step towards seeking solutions to problem areas, an evaluation of the tutor's role in facilitating small group learning is equally vital. A particular area that was looked at was the pattern of reactions by the tutor to a student's contribution in the small group learning sessions. It was observed that one of the most

The figure below shows a matrix which demonstrates the choices of the above sociogram.

(X = symbol for group as a whole; used when a speaker addresses the whole group

important keys to successful group discussion is the ability of the tutor to respond well to the contributions made by students. This is particularly so in our local context, when students are less spontaneous and more conscious of the impact of their responses on their peers in the group.

An observation checklist is used in this instance. Table I shows a typical checklist listing the reactions of a tutor to his student's contributions in one of the small group problem solving sessions that was observed. To sample responses from different phases of the sessions, one contribution was selected every 3 to 5 minutes. A tick was made in the appropriate ros(s). One column was used per contribution.

TABLE I

The contribution was:	1	2	3	4	5	6	7	8	9	10	TOTAL
Ignored											
Merely acknowledged											
Paraphrased		✓	✓						✓		3
Praised	✓			✓	✓		✓			✓	5
Corrected								✓			1
Rejected											
Used to introduce new information on new topic						✓	✓		✓		3
Used to change to new topic											
Used to go back to a previous topic or point											
Used as part of a summary of discussion					✓					✓	2
Followed by question to previous speaker who answers											
Followed by question which tutor answers himself											
Followed by question to members of the group	✓					✓	✓				3
Other reactions											

Conclusion

In summary an initial step has been attempted to improve the process of small group learning and teaching in School of Medical Sciences. The above strategy had been tried on three such groups with encouraging results. While findings from these three groups are far too small to be of much significance, they do support the general view among our academic staff and students that greater attention should be given to the process of problem solving and group dynamics in our small group sessions.

TROPICAL MEDICINE

STRENGTHENING OF RESEARCH CAPABILITIES IN TROPICAL DISEASES IN DEVELOPING COUNTRIES

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In the last two decades, the scientific development in many of the Third World countries was largely confined to a few medical research institutes and universities. Some of these institutions were colonial legacy and there were timid attempts to start a formal process of scientific and technical development as a part of the national planning processes. The pressure for this kind of action resulted from the interest of the newly born scientific community to participate in socio-economic development. In attempting to identify the role of science in development, a number of countries decided to create Ministries for the development of Science or the establishment of National Councils for Science and Technology. The importance of health care as opposed to medical care has not yet been universally accepted in all developing countries. Also the importance of health in socio-economic development is a concept which is only recently dawning on developing countries. The World Health Organization has played a leading role in emphasizing the necessity of placing higher priority in health and recognizing its importance in socio-economic development.

As a parallel development, several funding agencies decided to offer training opportunities to Third World countries or to support isolated research projects through research grants. Unfortunately, in the majority of the cases, this support was almost exclusively confined to the research conducted in the Universities and some medical research institutes on subjects which frequently did not have any connection with the more urgent needs of the Health Ministries. In the late sixties economic and social plans were formulated in an attempt to improve this situation and by the end of the seventies, it was realized that science and technology must be used to attain national development and self-reliance.

Although a number of funding agencies were actively involved in the support of research and research-training activities in tropical diseases none was particularly interested in supporting the development of better conditions for research and post-graduate education at the institutional level. For example, until recently there has been no formal post-graduate teaching programmes in fields such as medical entomology, medical parasitology, and epidemiology — subjects which are of utmost importance tor the control and management of many of the tropical endemic diseases. At the undergraduate

level although many universities did include in their curriculum the teaching of medical parasitology, by and large, this were very minimal and normally included as part and parcel of the teaching of pathology or microbiology.

Malaysia certainly had set an example in this direction and undergraduate teaching in the field of medical parasitology is an integral part of the medical students' curriculum.

There were also isolated attempts in different parts of the world by WHO and other agencies to strengthen the scientific infrastructure of the institutions through various mechanisms particularly through the donation of modern scientific equipment. Unfortunately, only a few of these institutions were able to use these equipment properly for their improvement, as in many cases, this effort brought out the painful reality of lack of well trained professional staff having the necessary expertise. There are also examples which one can find where bilateral agencies has put-in considerable amount of money in creating new research institutions without adequate provisions for increase trained scientific staff resulting in the creation of scientific "white elephants".

It is at this stage the initiation of actions towards a planned and systematic approach towards strengthening of research capabilities in developing countries under the Special Programme for Research and Training in Tropical Diseases commenced in 1977. The essential elements of institutional support by the Special Programme have been to gradually build up a critical mass of scientists in the developing country research institutions at a rate commensurate with the pace of development of each country. Through these efforts, a number of institutions have been strengthened and numerous scientists trained in many areas of modern medicine and biology. The ultimate aim of TDR institution strengthening activity being to provide support to national institutions in the national context to national scientists in order to build up self-reliance and capability to carry out the necessary research and training activities to combat and control tropical diseases.

RESEARCH TRAINING IN MEDICAL EDUCATION

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Institute for Medical Research Kuala Lumpur

Introduction

Although there is a rapid increase of graduates in medicine or life sciences at doctorate level, there is a dearth of medical scientists engaged in health science research. One explanation for this is that interest in research requires a great deal of personal motivation, a wide range of knowledge, of skills as well as ability. But these types of qualifications/characteristics are not easily found in recently qualified graduates, especially when the current medical education curricula do not accommodate these developments and students with research interests have to acquire these as post-graduate experiences. More and more countries of this region have recognized their research needs and are striving to develop their research capabilities. As a short-term measure, attempts have been made by medical research institutes to pave the way for research by providing an opportunity to learn about research by working under senior researchers of the faculty or organizing seminar, short courses or conducting workshops. All these are still pragmatic approaches with combination of their merits and demerits in teaching research in health science.

Over the past five years, the WHO Regional Centre for Research and Training in Tropical Diseases has played a leading role in conducting workshops and courses (as the need arose) on research design and methodology to young scientists as well as reserach managers engaged in medical/health research. So far, nine reserach institutes (Annex 4) from five countries have been involved in conducting these courses. The methods and types of course materials used are rather diverse, tailored to suit the level of research situations as well as research needs of these countries. But the common aim was to expose participants to the principles of research, research design and methodology and finally how to formulate research proposals by using these methodologies.

1. Research Design and Methodology

The core content of the workshop is essentially the structure or system of a research design. Of course, at the initial stage of this type of workshop, the system encompassed functional and interdisciplinary programme (courses) (Annex I), directed to meet the urgent need of exposure in research by young scientists as well as managers. In this process, the functional and interdisciplinary programmes constituted the research design with elements of principles of research, translation of these principles into application, methods involved and support, etc. Subsequently, with accumulated experiences and mechanisms of conducting the workshops to differing level of participants, needs in several countries and to facilitate research development, a research design system (Annex 3) was possible to be formulated. The research design

system stretched the scope of the workshop and at the same time allowed both categories of professionals, namely young scientists and research managers to participate in the same workshop with their diverse professional backgrounds.

1.1 Workshop Design and Methodology Study Framework

The contents of the workshop were organized in a systematic framework of research design for use in biomedical, clinical and health service research (Annex 2). The objectives were set with "a priori" knowledge of the need of a workshop in the institute/country which could be accomplished by following the course contents. Type of objectives:

General

(a) Develop increased skills in the design of biomedical research which follows a rational conceptual framework for problem identification, formulation and solution, utilizing a methodology which is scientifically sound and appropriate to the needs and resources;

(b) design, plan and draft protocol proposals for research which meet with acceptable standards nationally and internationally.

Specific

At the conclusion of the workshop, the participants are expected to:

(a) have a better understanding and appreciation of the scientific method as it applies to biomedical and health research;

(b) be able to give a precise statement of the problems to be investigated and of the objectives of research into these problems;

(c) be able to frame the pertinent hypotheses, which can then be tested by scientific methods to produce valid useful results;

(d) be able to construct a research proposal by selecting and applying the appropriate study design and methods, taking into account characteristics of the study population, sampling, selection of controls, bias, confounding, variables to be measured, limitations of testing, availability of resources and time;

(e) be able to execute the research within the guidelines of the proposal, using proper experimental design and methods of data collection, processing, analysis, and considering on-line monitoring as well as end-evaluation of the research;

(f) be able to properly interpret and effectively present the results to fellow scientists and investigators, policy makers and administrators, and the public.

1.2 Time-frame and Daily Activities

At the early stage of conducting such workshops, fourteen days were necessary to cover mainly lectures, group work and research protocol proposal. Subsequently, with enhanced skills by the Centre staff and reorganization and coordination of the course materials, ten days were found to be adequate to cover the subjects (Annex 2). The details of each module of

Annex 2 are available in each workshop report (reference No. 2) of the country.

2. Research Design System

In the evaluation sessions of the workshops in different countries, it is being advocated that the above mentioned type of research design and methodology encompasses the system concept, and is effective for research workers who would plan, conduct the research and analyse, interpret and present the results in one form or other. However, it exceeds or falls short for research managers and policy makers who may not be directly involved in research but are expected to understand and support it and use its results. Only if the understanding and capabilities of both these two groups are strengthened in an appropriate and coordinated fashion, will the issues on research development in general be improved. With this in view, a research design system (Annex 3) with coordination of three components, namely system of research design, epidemiology and biostatisticvs (and all incorporated in the earlier type of study framework) is developed. The first component is prescribed for the research managers and policy makers whereas all the three components are for the research workers.

3. Workshops of Various Countries

The list of the nine workshops (one planned for October 1986) held in five countries with pertinent information are being provided in Appendix 4. By looking at the number of participants, their background, professional maturity and research capabilities, it becomes a surmountable task to organize a workshop in compliance with their genuine need and subsequent fulfilment by the workshops. The objectives coupled with a practical and effective programme, and their careful organization, selection of groups comprising different professional background, allocation of research topics for discussion and research proposal, all of these greatly contributed to a productive workshop. In some of the workshops, special type of research topics were accommodated to meet the special need under a special circumstance. These are recorded in the last column of Annex 4.

4. Evaluation

Although subjective type of evaluation has a built-in system of observations on daily progress of activcities, series of didactic lectures on topics of group work, individual participation and case presentations of the topic with illustrations of design and methodologies, a formal objective evaluation followed at the end of the workshop. A questionnaire with combination of qualitative response with regard to degree of fulfilment of the set objectives and score system on each of the subjects covered in the workshop, was given to the participants.

On average, the response to the five most important questions leading to objectives regarding: (1) knowledge on broad perspectives of the field of medical research which will be useful in their research work; (2) framework of approach which would prepare to conduct research and better evaluation; (3) skills for conducting research and construction of research proposal; (4)

motivation for promoting and conducting research; and (5) confidence in selecting and following scientifically sound approach to research problem, were 95% positive for 1, 2, 3 and 4 and 92.4% for the 5th respectively. An interesting but negative evaluation on 5th is that 3.8% (n = 36) achieved "lessened" confidence, which is perhaps due to the rigorous procedures one has to undergo in research. Regarding the length of the course (14 days) 41.2% adequate. 8.8% too short and 50% too long when changed to 10 days these percentages were 75%, 3% and 22% respectively. It is worthwhile to mention that this 22% comprises the participants who are either experienced research scientists of the professionals with the sole responsibility in management and research. Almost all the participants were in agreement about the need of continuing such type of regional workshop.

5. Conclusion

The research training courses conducted or organized by medical institutes of the region are of the following types: (1) short courses for 1 week or so confining to a particular discipline, (2) individual attachment to a research project (generally under a senior faculty member) as the academic requirement, (3) occasional seminars. The advantages as well as disadvantages of such type of courses as compared with the ideal situation of long term research training lasting for a year or incorporation of research training in the regular medical curricula, are well expressed in all the workshops held in the various regions.

The WHO Regional Centre for Research and Training in Tropical Diseases/IMR, Kuala Lumpur, has made an endeavour to meet an initial need to provide solid grounding and appropriate motivation to initiate, conduct or perform research, following selective facets (out of many) of proper scientific design and methodology. While such workshops could solve the short term need for competent researchers in various institutes, the real answer lies in the adoption of a proper foundation in research methodology in the curricula of the medical institutes.

In all the workshops conducted in nine institutes (Annex 4) from five countries of the region, the orientations are towards methods and disciplines, mainly in the biomedical area. However, a workshop held in IMR, Kuala Lumpur, brought in the clinical as well, and the Research Institute for Tropical Medicine, Philippines, similarly brought in the health services component. This has paved the way for a workshop which could combine biomedical, health system and perhaps behavioural research. Such a workshop would contribute to the global research strategy aimed at supporting the WHO's goal of achieving health for all by the year 2000.

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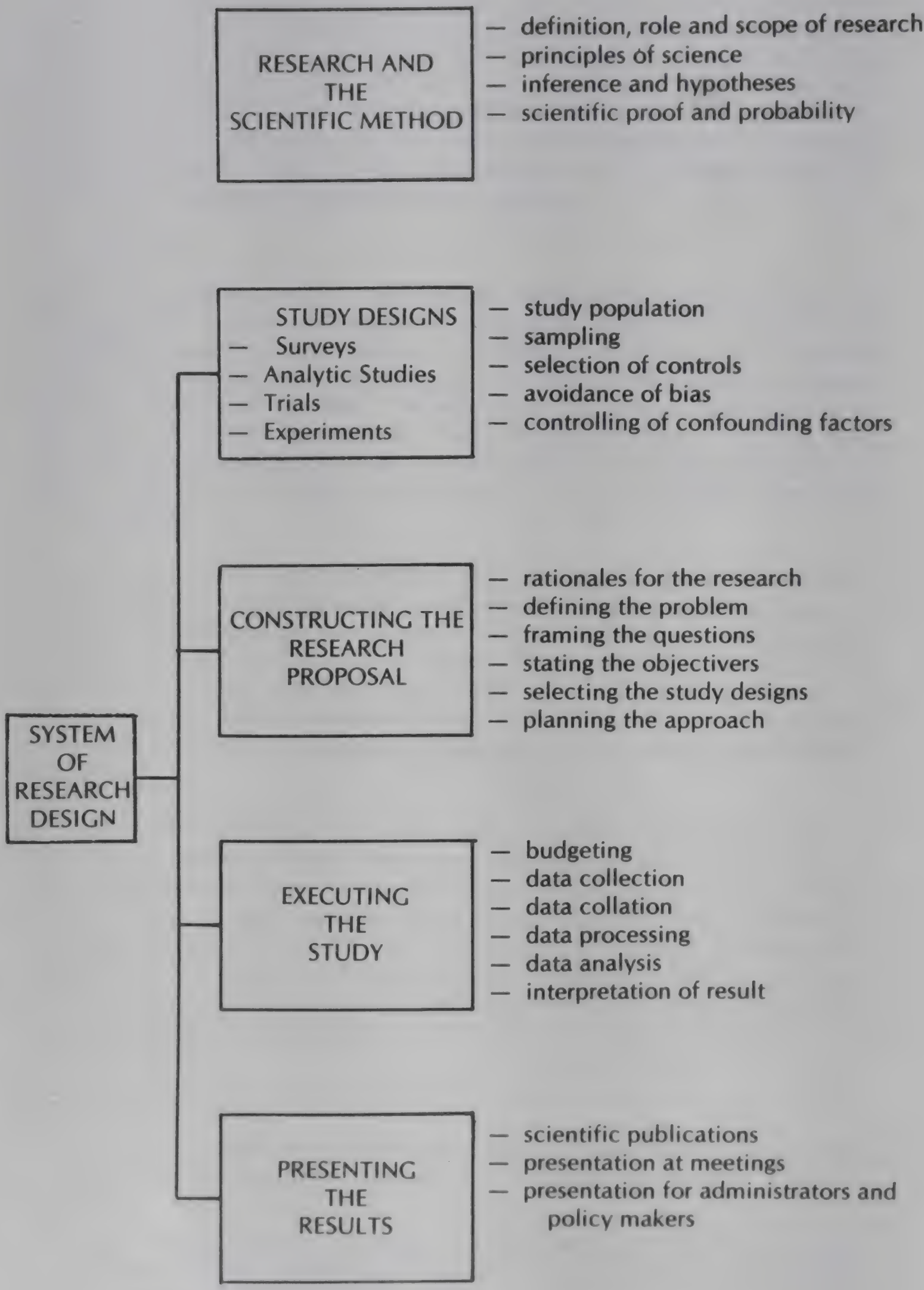
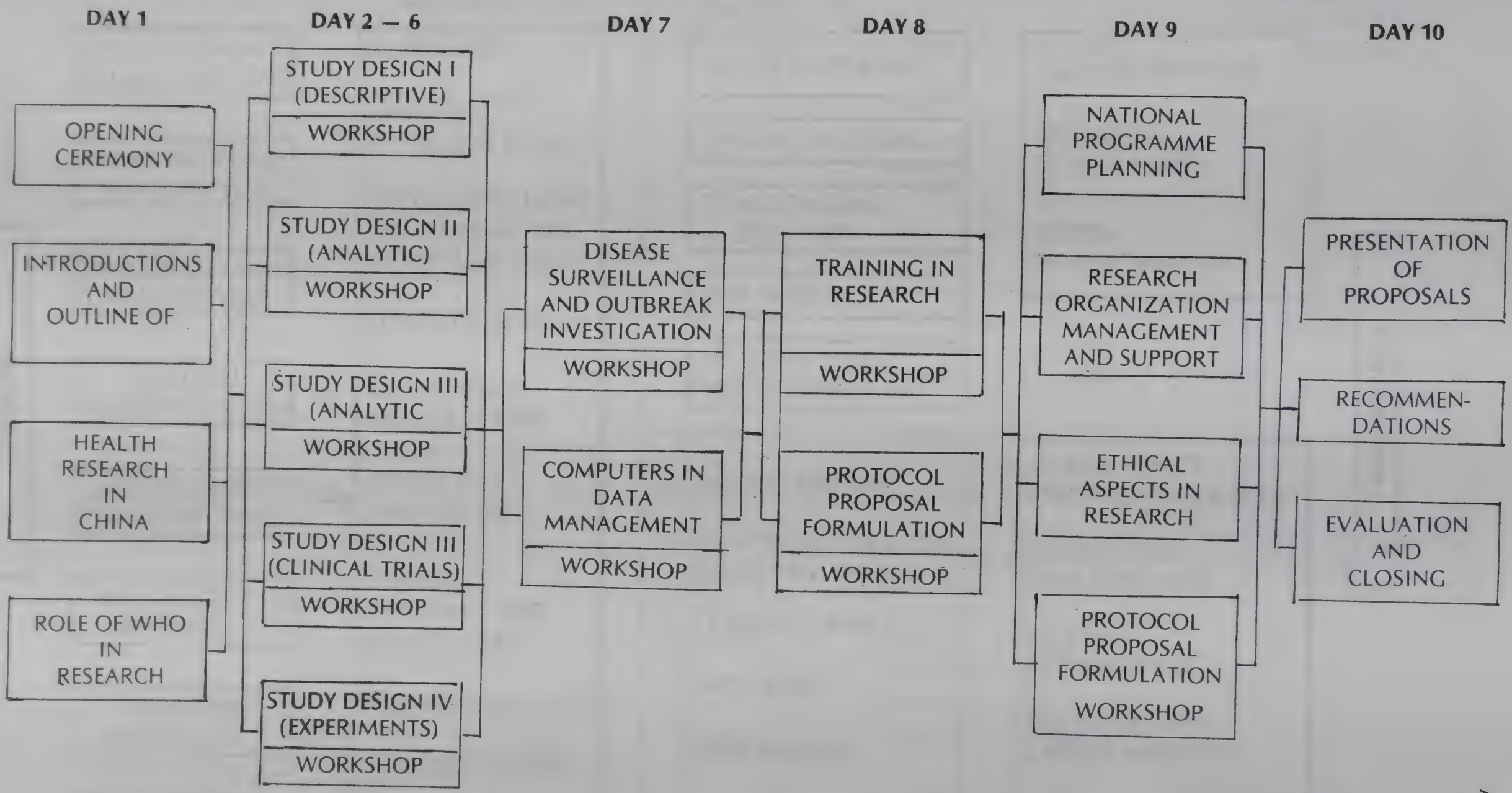
RESEARCH DESIGN AND METHODOLOGY STUDY FRAMEWORK



ACTIVITIES FLOWCHART OF THE WORKSHOP



THE SYSTEM OF RESEARCH DESIGN

EPIDEMIOLOGY

BIOSTATISTICS

OPENING

RES. PROBLEMS AND OBJECTIVES

REVIEW OF LITERATURE

RESEARCH HYPOTHESES

RESEARCH PLANS AND METHODS

IMPLEMENTATION OF STUDY

DATA-CLEANING AND PROCESSING

ANALYSIS AND INTERPRETATION

REPORT WRITING (SCIEN. ADMIN.)

RESEARCH PLANS AND METHODS

RESEARCH DESIGN

RESEARCH SETTING

POPULATION, SAMPLING AND CONTROLS

DATA TO BE COLLECTED

METHODS AND INSTRUMENTS

ETHICAL ISSUES

PLANS FOR DATA COLLECTION AND FIELD OPERATIONS

PLANS FOR DATA ANALYSIS

BUDGETING

STUDY DESIGNS AND STRATEGIES

DESCRIPTIVE

ANALYTICAL

CLINICAL TRIALS

EXPERIMENTAL AND EVALUATIVE DESIGNS

SPECIAL DESIGNS

MEASUREMENT IN EPIDEMIOLOGY

RISK ANALYSIS

BIAS AND CONFOUNDING

CAUSAL INFERENCE

OTHER CONCEPTS

DESCRIPTIVE STATISTICS

TABLES AND DATA PRESENTATION

SIGNIFICANCE TESTING

SAMPLING AND SAMPLE SIZE

ADVANCED METHODS AS APPLICABLE

SOCIAL SCIENCE

QUESTIONNAIRE DESIGN

QUALITATIVE METHODS

OPINION SURVEYS

EVALUATION

SUBSTANTIVE AREAS AS APPLICABLE

PRACTICUM : DEVELOPMENT OF OWN PROPOSAL

LIST OF WORKSHOPS WITH SPECIAL CHARACTERISTICS

Institute	Duration of Workshop	No. of Participants	Type of Participants	Special Characteristics of the Workshop (Emphasis)
1. Institute of Basic Medical Sciences Beijing, China	5—15 May 1981	30	research associates, lecturers, physicians, associate professors, professors, administrators, chief technician	Biomedical science
2. Institute for Medical Research, Kuala Lumpur, Malaysia	10—20 November 1981	29	medical officers, veterinary officer, scientific (research), biomedical engineering	Biomedical research and field studies
3. Research Institure for tropical Diseases, Alabang, Philippines	24 August — 2 September 1982	health services component : 25 biomedical research component : 19	senior health services administrators and managers chief of large clinics and provincial hospitals, medical and scientific research specialists from universities and research institutes	Combination of biomedical and health services research
4. Institute of Parasitic Diseases, Shanghai	25 October — 5 November 1982	26	lecturers, associate professors, research associates	Tropical diseases research

Institute	Duration of Workshop	No. of Participants	Type of Participants	of the Workshop (Emphasis)
5. Institute for Medical Research, Kuala Lumpur, Malaysia	4—16 October 1982	25	medical, biostatistics, biologisdts, veterinary public health, chemistry and pharmacology	Combination of biomedical and clinical research
6. Institute of Population and Health, Seoul, Republic of Korea	20—28 October 1983	33	professors, associate professors, lecturers, research associates or scientists	Biomedical and field studies
7. Institute for Medical Research, Kuala Lumpur, Malaysia	11 — 13 May 1983	15	clinicians and medical officers	Clinical research
8. Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia	7—18 May 1984	38	clinical specialities, public health including preventive medicine, preclinical sciences, paraclinical sciences	Biomedical, clinical and laboratory experiment
9. Chinese Medical University, Shenyang, China	26 August — 6 September 1985	26	lecturers, professors or attending physicians, research scientists, armed forces	Biomedical, clinical and public health research
10. School of Biological Sciences, Universiti Saïns Malaysia, Penang, Malaysia	14—25 October 1986	30	biologists and pharmacists	Biological pharmaceutical research

EVALUATION

Six main questions regarding usefulness of workshop:

Questions	Average % of Positive Answer from Nine Workshops
1. Acquired knowledge to be useful in research work	95
2. Framework of approach which would prepare to conduct research and better evaluation	
3. Skills for conducting research and construction of research proposal	
4. Motivation for promoting and conducting research	
5. *Confidence in selecting and follwing scientifically sound approach to research problems	92.4

**Interesting to note 3.8% (n = 36) achieved "lessened" or "dampened" confidence on research after going through workshop.*

Length of Workshop	Adequate	Too Short	Too Long
14 days	41.2%	8.8%	50%
10 days	75.0%	3.0%	22%**

***Comprises participants who are experienced research scientists or professionals with sole responsibility in management and research.*

EXAMPLES OF RESEARCH TOPICS CHOSEN BY GROUP OR INDIVIDUAL FOR PREPARATION OF RESEARCH PROTOCOL DURING WORKSHOP (FEW OF THESE WERE LATER ACCEPTED FOR SUPPORT BY WHO OR OTHER AGENCIES)

1. Descriptive (Survey) — "A census survey of fertility patterns among different national groups of Yunnan Province".

2. Case-Control — "The association of cigarette smoking and cancer of the lung in Tjien Tsin, China".

3. Cohort — "A prospective study of the association between HVC infection, chronic hepatitis and primary carcinoma of the liver in China".

4. Clinical Trial — "Phase I and Phase II clinical testing of inactivated HbSAg vaccine in China".

5. Field Trial — "A field trial of the safety and protective effects in children of vaccination with a live attenuated strain of polio virus number 638".

6. Laboratory Experiment — "The effects of acupuncture upon the development of major-vessel atherosclerosis in the rabbit model".

7. A study of urine aldosterone level in diabetic nephropathy Conn's and related diseases and normal subjects in Malaysian population.

8. To compare the effectiveness of Ranitidim and Cimetidim in building of duodenal ulcer.

9. Prevalence study of HbsAg, H B_eAg and Ante-HB_c in volunteer blood donors amongst prisoners.

10. An epidemiological study of malaria in Bengkoka Peninsula, Sabah.

11. Evaluation of rehabilitative measures to halt the rapid progression of grade I silicosis, with a comparison between treatment at home and in a health resort.

12. Comparison of the cancer mortality recorded in a metallurgical plant with cancer mortality among general population, the workers in a machine factory and non-exposed workers in the same factory.

13. An unscheduled DNA synthesis system for testing effects of nitrosamines on gastric mucosa cells.

14. An etiologic survey of human acute leukaemia in China.

15. Observation on the effects of mebendazole on hydatid disease in mice.

16. Effects of furazolidine on peptic ulcer: An experimental study on rats.

17. Observation on the effects of the vasodilator isosorbital dinitrate, on heart failure in children's pneumonitis.

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TEACHING OF UNDERGRADUATES IN AN INTEGRATED MEDICAL CURRICULUM: TROPICAL DISEASES OF PARASITIC ORIGIN

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ABSTRACT

Learning experiences within an integrated medical curriculum are phased, spiral in nature and problem-solving in approach. Spiral reflects a particular activity which is usually repeated; as a result what the student gains, as he progresses through the years, is a deeper understanding of basic medical knowledge. In the traditional medical systems, the teaching of parasitology has always been considered a basic science. In the integrated medical curriculum it has to be modified to cater for the clinical approach. In doing so, one has to teach medical parasitology under the canopy of clinical sciences within the problem-solving approach. A proper understanding of parasitic diseases requires familiarity with the disciplines of applied zoology, immunopathology, epidemiology and clinical practice. Our teaching approach departs from the more normal and conventional approach of dealing with parasitic diseases in the sequentials of zoological taxonomic hierarchy. The new approach adopted in the Universiti Sains Malaysia Medical School allows the view-point of the different discipline to be presented in a more realistic manner. This new approach in teaching of parasitology and how it can be integrated into the mainstream of clinical teaching in an integrated medical school programme is discussed.

Introduction:

Over the years, the philosophy of all medical schools has remained the same, while the medical curriculum has undergone drastic changes through hypertrophy and atrophy of certain disciplines. Essentially all medical curricula focus on the philosophy, relevance of contents and skills to be developed in order to meet the needs of the local community and nation. However, in the planning of any curriculum, local needs should take precedence; at the same time, global needs should not be ignored.

Students at the end of their medical course should be able to recognise correctly the morphological characteristics of parasitological agents, recognise signs and symptoms due to parasitic infections, describe the pathophysiology underlying these infections, perform or request relevant laboratory investigations and elucidate the principles of management of these infections as well as elicit control and preventive measures.

With this in mind, the curriculum of Medical Parasitology is designed

Methodology:

The medical curriculum at Universiti Sains Malaysia is divided into three phases namely:

Phase I	—	Year 1
Phase II	—	Year 2 and 3
Phase III	—	Year 4 and 5

The phases are linked and spiral in nature. As the students advance, the teaching of Medical Parasitology shifts from basic sciences to clinical skills. Medical Parasitology as a discipline is integrated into the organ-based system. It is taught throughout the curriculum under well-defined sets of specific objectives.

The basic foundation of medical parasitology is laid in Phase I, while the application aspects are taught in Phases II and III. The detailed implementation schedule is as in Appendix I & II.

SPECIFIC OBJECTIVES:

The students will be expected to acquire the following concepts and knowledge:

1) General classification or protozoa, helminth, and arthropods of medical importance (Fig. 1 and 2).
2) Differentiation of specific parasites of medical importance.
3) Description of life cycle of selected parasites e.g. soil-transmitted helminths, arthropod-borne, vector-borne and food-borne parasites.
4) Principles involved in the collection of specimens.

In the traditional medical curriculum, the teaching of objective 1 in Medical Parasitology is entirely based on the zoological nomenclature. The new approach at the Medical School in Universiti Sains Malaysia is different in that it emphasizes the classification of parasites based on organ-system approach in humans.

Phase II

Phase II is the organ-system approach. In this phase, further aspects of the scientific basis of Medical Parasitology is introduced. The specific objectives for this phase are as follows:

1) List important parasites that infect humans.
2) Briefly describe the life cycles of selected parasites that are of medical importance.
3) Describe the different mode of transmission of various parasites.
4) Describe the symptomatology and pathogenesis of parasitic infection.
5) State the principles of management for helminthic and protozoan infections.

6) Describe factors that favour the presence and spread of parasitic infections in the community.

Other Cognitive Components and Skill Development

1) Community and Family Case Studies (CFCS).
2) Electives
3) Laboratory & demonstration session.

CFCS:

Under the CFCS programme students carry out weekly visits and cover different packages of planned activity e.g. maternal and child health care, school health programme, nutrition and infection and finally, health resources programme. Under these packages the students learn to collect specimen and perform simple laboratory diagnosis of parasitic infections.

Electives:

In our medical curriculum, we find that the majority of the students are satisfied with the teaching objectives of medical parasitology. Obviously, there will be students with special interests in medical parasitology. For these students, electives are provided. For example, elective for Phase I is Parasitological Methods, which emphasizes mainly on the laboratory techniques in the diagnosis of parasitic diseases. In phase II the electives can be an experimental or field study on any parasitic infection that is prevalent in this country.

Laboratory and demonstration sessions:

These are sessions which are carried out with the different teaching/ learning packages in a particular phase. Laboratory demonstration in general take the form of fixed learning modules (FLM). In addition, the students are also provided with tape-slide programmes of topics currently discussed in a particular package. Similarly, the laboratory sessions are held in an integrated manner with the various disciplines.

The specific objectives for practical skills in Medical Parasitology require the students to:

1) Prepare smears from solid and liquid specimens for staining and microscopic examination.
2) Perform wet mounts for microscopic examination of sputum, urine, blood and faeces for parasites.
3) Perform wet mounts of skin scrappings for examination of parasites.
4) Perform direct smears of faeces for microscopic examination of parasites including trophzoites, cysts and eggs.
5) Perform simple staining techniques for the faeces such as iodine preparation.

6) Take specimens of anal swabs and perform microscopic examination for Enterobius.

7) Take specimens of vaginal swabs and examine for Trichomonads under the microscope.

8) Prepare wet thin and thick blood smear for staining and microscopic examination for filarial and malarial parasites.

CONCLUSION

Based on our experience, the teaching of medical parasitology can easily be carried out in an integrated medical curriculum. The advantages in this system allows medical parasitology to be taught in a more meaningful manner in relation to the systems approach. The use of fixed learning modules encourages self-learning while the use of small group learning and problem solving exercises requires active student participation in the learning process. The primary disadvantage of the integrated curriculum is the lack of medical parasitology reference books using the body system approach.

APPENDIX I

BLOCKS*	IMPLEMENTATION DETAILS FOR PHASE I
GROWTH & DEVELOPMENT	Introduction to Medical Parasitology. General classification of parasitology, helminths and arthropods of medical importance.
CELLS & TISSUES	Basic concepts on growth, development and reproduction of protozoa and helminths of medical importance.
BLOOD	Introduction to parasites of blood.
NERVOUS SYSTEM	Introduction to parasites of CNS.
MUSCULO-SKELETAL/ LOCOMOTOR SYSTEM	Introduction to parasites of the musculo-skeletal system eg. Sarcocysts, **Trichinella spiralis**.
RESPIRATORY SYSTEM	Introduction to parasites of respiratory system, eg. **Paragonimus** sp. (lung fluke)
DIGESTIVE SYSTEM	Introduction to parasites of GIT eg. protozoa, nematode, cestodes and trematodes.
ELECTIVES	Introduction and methods in Medical Parasitology.
RENAL SYSTEM	Introduction to parasites of renal system.
REPRODUCTIVE SYSTEM	Introduction to parasites of reproductive system.
HOST & ENVIRONMENT	Basic concepts and general outlines of life cycle of parasites. Introduction to occupational parasitic diseases.

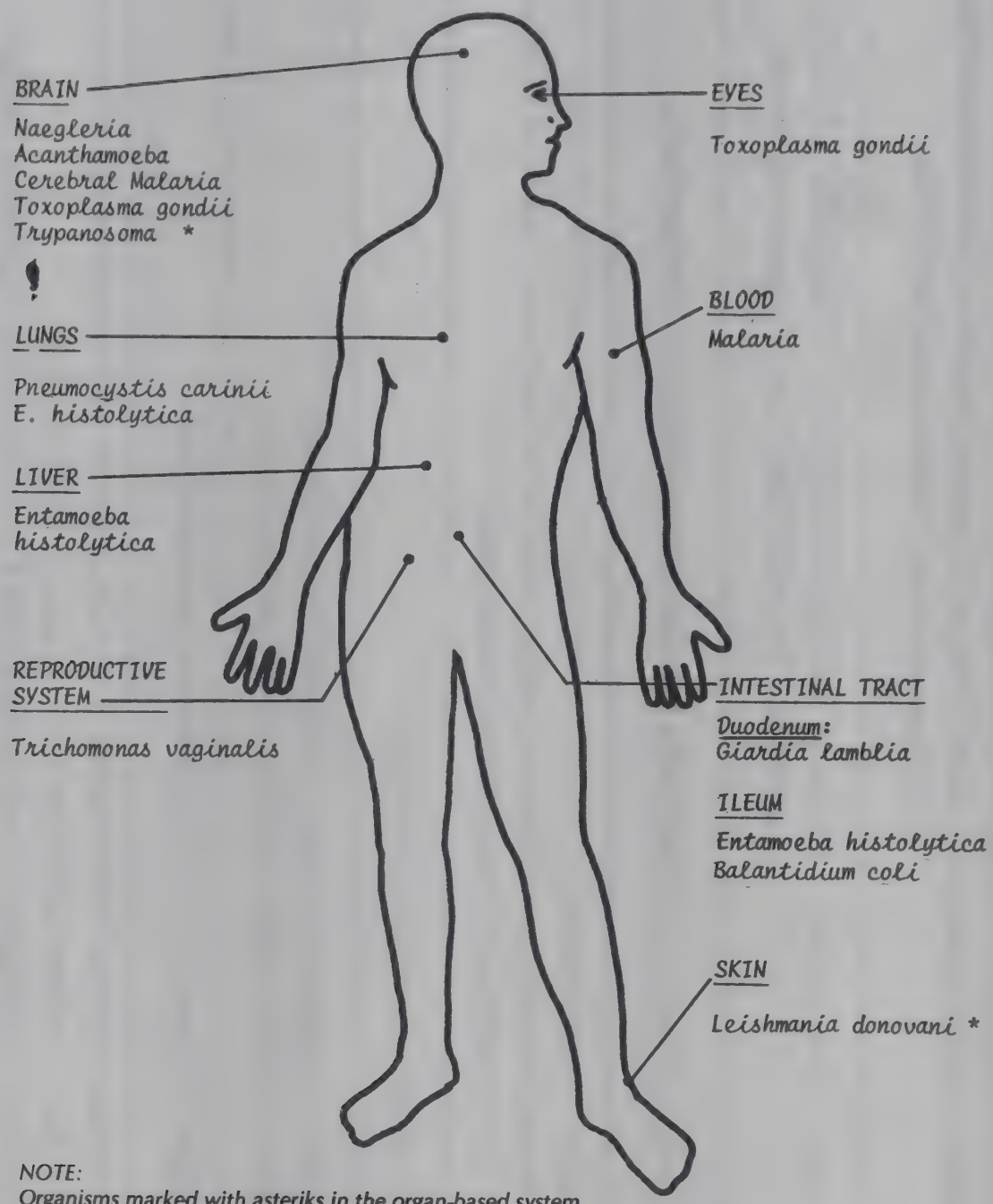
*The academic year for phase I is divided into fourteen blocks based on organ-system.

APPENDIX II

BLOCKS*	IMPLEMENTATION DETAILS FOR PHASE II
GASTROINTESTINAL SYSTEM	Problem: Diarrhoea : **Entamoeba histolytica.** Problem : Liver abscess : Liver flukes eg. **Fasciola, hepatica, Schistosomes sp. Echinococcus sp., Entamoeba histolytica.**
CENTRAL NERVOUS SYSTEM	Problem : Meningitis : Primary meningoencephalitis (**Naegleria, Acanthamoeba sp.) Toxocara canis** and **Angiostrongylus sp.**
MUSCULO-SKELETAL SYSTEM	Problem : Myositis : **Trichinella spiralis, Sarcocystis** and **Cysticercosis.**
RESPIRATORY SYSTEM	Problem : Hemoptysis : Pulmonary amoebiasis, Pneumocystosis, Loeffler's Syndrome, Tropical Pulmonary Eosinophilia and **Paragonimus westermani** (FLM).
HAEMATOLOGY	Hookworm infections (Laboratory).
REPRODUCTIVE SYSTEM	Problem : Vaginal discharge : **Trichomonas vaginalis** Problem : Intra-uterine infections : Toxoplasmasis
RENAL SYSTEM	Problem : Haematuria : **Schistosoma haematobium.**
COMMUNICABLE DISEASES	**PROBLEM : FEVER WITH RASH** : Introduction to vectors and mosquitoes. **PROBLEM : FEVER WITH RIGOR** : Malaria and Filariasis **PROBLEM : VOMITING AND DIARRHOEA** : Amoebiasis, Giardiasis, Balantidiasis, Soil-transmitted helminths **PROBLEM : WORM IN THE FAECES** : Cestodes and Trematodes, Zoonosis, Venomous arthropods.

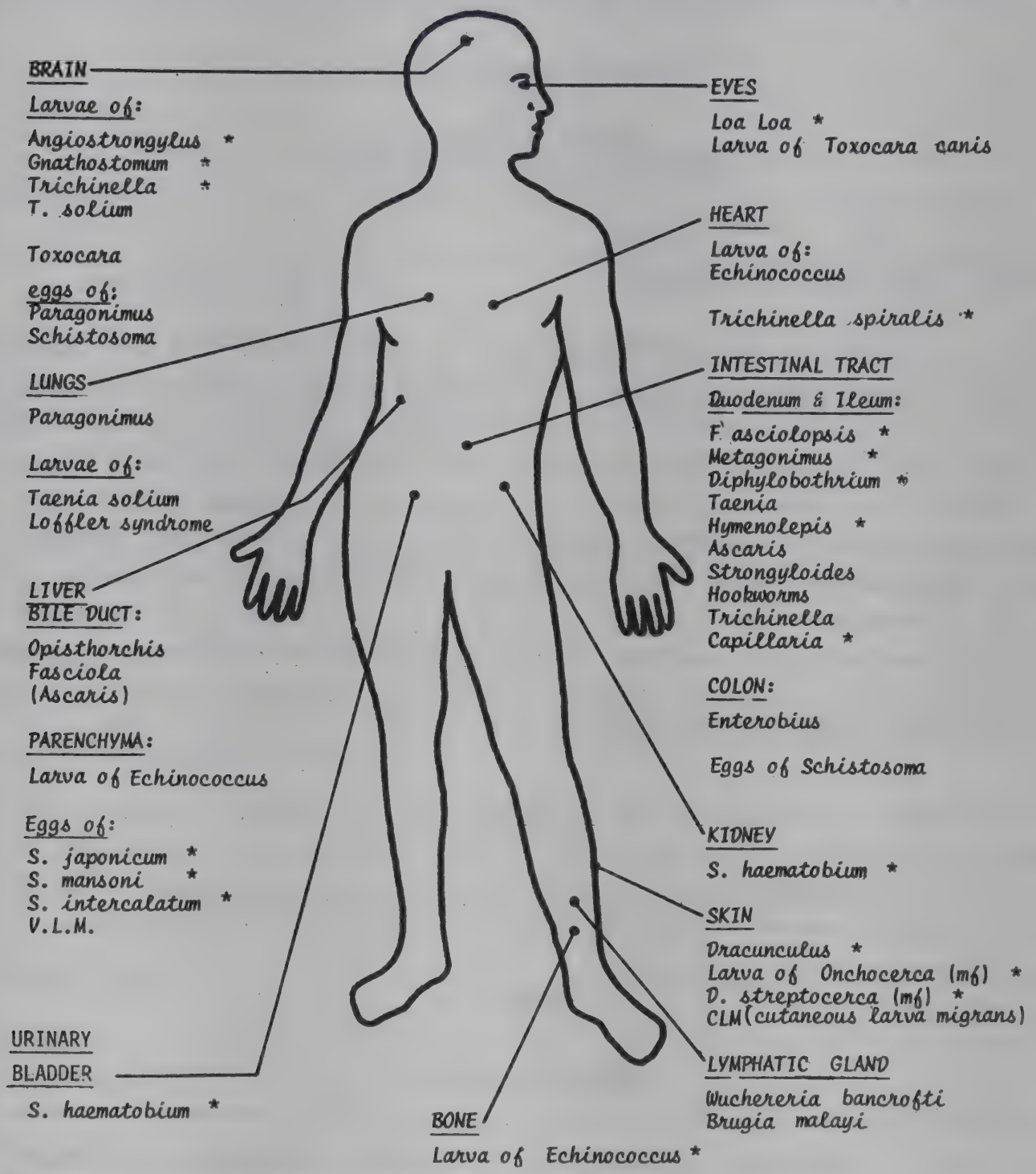
*The academic year for Phase II and III are divided into eight blocks based on organ-system.

Fig. 1: HUMAN PROTOZOAN INFECTIONS



NOTE:
Organisms marked with asteriks in the organ-based system are given less emphasis in the teaching sessions.

Fig.11: HELMINTHIC INFECTIONS



NOTE:
Helminths marked asteriks in the organ-based system are given less emphasis in the teaching sessions.

TEACHING OF TROPICAL MEDICINE FOR STUDENTS IN THE REGION — AS RELEVANT TO PHYSICIAN TODAY, TOMORROW

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Chairman, Ladies and Gentlemen,

Thank you very much for the opportunity to take part in this International Conference on Medical Education. The subject given to me is "Training of Students in Tropical Medicine". A keynote address I feel must open the doors and throw light on the subject so that fruitful discussions and wise decisions will come out of the symposium. The physician tomorrow is the medical student today and it is therefore important to look at any training programme at the undergraduate stage if we are to achieve the desired result tomorrow. The bulk of medicine that is taught in South East Asian region is the medicine of the West and affluent countries. Their health problems and disease patterns are different and are not very relevant to what our students would face when they come out of the medical school.

The key words in this lecture are tropical medicine, student training and the region. I shall touch on the region first. Table 1 shows the area of the Asean region and the population of its member countries. It is important to note that seventy to eighty percent of the population of Asean are in rural tropics.

Table 1

ASEAN Countries

	Indonesia	Malaysia	Philippines	Singapore	Thailand
Population (mid 1979)	142.9m	13.1m	46.7m	2.4m	45.5m
Area 1000 sq. km.	1919	330	300	0.224	514
GNP percapita 1979 (US$)	370	1370	600	3830	590
Average Annual growth % 1960 — 1976	4.1	4.0	2.6	7.4	4.6

*Source: World Development Report 1981

Table 2 shows a comparison ot two regional economic groupings the Asean and EEC. Asean has a population of 250 million which is about the same as that of the European Economic Community but its average per capita income is US$1350.00 which is only one sixth of that of the EEC (US$8800.00) and this will be much less now in 1986 because of the recession.

Table 2

ASEAN and EEC Countries

	ASEAN	EEC
population mid 1979	250.6m	270.9m
Area 1,000 sq. km.	3063.2	1658.9
GNP per capita 1979 (US$)	1352	8800
Average annual growth % 1960 — 1979	4.5	3.2

Source : World Development Report 1981

Disease Pattern in the Asean Region

Table 3 and 4 give the major causes of illness in Thailand and the major causes of death in Philippines.

TABLE 3

Major causes of illness — Thailand (in-patient)

Types of illness	Rural Hospital	Hospitals in Bangkok
1. Diseases due to pregnancy including normal pregnancy	27.3	78.8
2. Infectious diseases — Total	31.5	10.5
G.I. infections	12.9	4.0
Respiratory infections	11.8	4.9
Mosquito-borne diseases	5.6	0.7
other infections (hepatitis etc)	1.1	0.9
3. Accidents & poisoning	13.8	5.4
4. Non-infective G.I. diseases	4.7	3.5
5. Psychoneurosis	3.6	2.7
6. Diseases of G.U. system	3.1	2.9
8. Malignant neoplasm	1.0	3.5
9. Diseases of the heart	1.4	1.9
10. Diseases of the skin	6.1	0.9

Source : Thai Medical Bulletin, 2 : 675, 1973

Table 4

Projected leading causes of Mortality — Philippines 1979

Causes of Death		Rate
1.	Pneumonia	118.1
2.	Tuberculosis	61.4
3.	Diseases of the heart	57.4
4.	Gastroenteritis & colitis	47.1
5.	Diseases of the vascular systerm	37.8
6.	Malignant neoplasm	33.5
7.	Diseases of early infancy	32.9
8.	Avitaminosis & other nutritional deficiency states	32.6
9.	Accidents	27.9
10.	Bronchitis	18.7

Source : Health Planning & Health Information in South East Asia SEAMIC, 1978.

The disease pattern in Singapore has changed. Table 5 shows this change. But even then there was a dengue alert this month. In June this year, there has been a sharp increase in the number of cases of dengue fever and dengue haemorrhagic fever with 70 cases reported for that month. In 1985 there were 126 cases with two deaths.

TABLE 5

The first ten causes of death in Singapore for the year 1981

1.	Cancer
2.	Ischaemic heart disease
3.	Cerebrovascular disease
4.	Pneumonia
5.	Accidents
6.	Diabetes Mellitus
7.	Hypertension disease
8.	Nephritis
9.	Tuberculosis
10.	Bronchitis, emphysema, arthritis

Source : Ministry of Health, Singapore

The need for Training of the Student in Tropical Medicine

The health problems in the South East Asian countries result from poor water supply, poor environmental sanitation and malnutrition. That is, a fair amount

of our health problems are those of tropical medicine. One might ask what is tropical medicine? Tropical medicine deals with health problems and diseases brought about by climatic and environmental conditions that are peculiar to the tropics. It is our medicine. Therefore we must know it well and practise it well if we are to solve our health problems adequately with limited resources. Water-borne diseases, insect-borne diseases, malnutrition and diseases from poor environmental sanitation form the bulk of our health problems. It this is so, we should not neglect the teaching of tropical medicine to our medical students. I do not say that tropical medicine is not taught at all in our medical schools. The amount that is taught and the way the students are trained in tropical medicine must be examined carefully if we are to bring in changes in the undergraduate medical curriculum.

Teaching of Tropical Medicine

Can the present day Professor of Medicine effectively teach tropical medicine? The broad-based all round Professor of medicine is no more. We are nowadays cardiologists, neurologists, nephrologists, endocrinologists or gastroenterologists. That is, experts in narrow field and therefore inadequate to teach and train medical students in fields outside our speciality especially in tropical medicine. The problem of training medical students in tropical medicine therefore continues to be neglected.

The Solution — Department or Division of Tropical Medicine

Training of medical students in tropical medicine would require firstly institutional commitment. The medical school must be committed to the teaching of adequate amount of tropical medicine at the undergraduate level. The institutional commitment must go hand in hand with commitment by teachers. This would require physicians interested and experienced in tropical medicine. Establishment of a **Chair in Tropical Medicine** would be a step in the right direction for it would in addition to enhancing the status of this subject would, also demonstrate and ensure commitment to this neglected field of undergraduate medical education in this region. The Professor of Tropical Medicine must be a qualified physician with full-time interest in tropical medicine. He must have supporting staff for an effective implementation of the programme. There could be a division of tropical medicine within the department of medicine and this division would be responsible for teaching, service and research in tropical medicine.

Training in Tropical Medicine

Lastly, I would like to touch upon training. Undergraduate medical education has changed over the years. The stress is now on education rather than any form of training and the medical graduate is expected to do vocational training for a few more years to fulfil a useful role in the community. Certain amount of training can be done during the five long years in a medical school. Training in tropical medicine of the student should include familiarisation with the problem in the community, skills in diagnosis, skills in relevant laboratory investigations, treatment of tropical diseases and their prevention. **A posting in tropical medicine** to achieve these objectives is necessary and the posting could last for 8 — 12 weeks. Adequate time for teaching and training of

students can and must be found in an already crowded undergraduate medical curriculum. Departments will fight for their share of time but institutional goals will have to take precedence over individual needs.

To sum up I would say that there is a need for teaching and training of students in tropical medicine. This can only be achieved in this age of specialisation and super-specialisation by creating a chair as well as a division of tropical medicine which will be responsible for teaching, service and research in tropical medicine.

NUTRITION EDUCATION IN AN INTEGRATED PROGRAMME

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WHAT TO TEACH

Decision on what to teach is not an easy task since we are dealing with an integrated system. Each discipline has to contribute a portion of their subject matter, but what is going to be integrated has to be relevant to the objective of the integrated curriculum and at the same time representative of the discipline. In teaching Nutrition we have to come up with a concise and meaningful information which is relevant. Nutrition is an integrative discipline to begin with and thus should not encounter much problems in integrating them. However, how much of the Nutrition information may be a problem. We are still in the process of trying to develop a more established curriculum and completing the jigsaw puzzle. To date the contribution of Nutrition Education involves Year I and Year II only. This is not to say that Nutrition is left out in other phases, only that they are not formally included in the program.

In Year I Nutrition is taught as an independent Block. The topic covers mainly basic nutrition knowledge being crammed into a one week course. The content of the course relate very much to other disciplines such as Physiology, Biochemistry and Behavioral Sciences, which are taught in the same phase. The main outline of the course is shown in Figure 1.

NUTRIENTS — BIOCHEM AND PHYSIO

NUTRITIONAL PROBLEMS — INDIVIDUAL, COMMUNITY, NATIONAL, WORLD

ASSESSMENT OF NUTRITIONAL STATUS

FOOD HABITS AND BELIEFS

Fig. 1: Main topics in Year 1 Nutrition Course.

The above content outline of the program covers basically the question on what to teach in Phase I. As a Nutritionist I definitely think that we have yet to come up with a more comprehensive and flexible curriculum on Nutrition.

In Phase II the question of what to teach gives us a more flexible curriculum. We have a 10 week package under the CFCS (Community and Family Case Studies) program in Phase II entitled **Nutrition And Infection** (Figure 2). The implementation of the Nutrition and Infection package assumed that the students are equipped with the knowledge of the previously given information (Year I). The subject matter still remain the same except that we are dealing with the particulars and the practicals. The student will carry out dietary surveys, anthropometric measurements and laboratory examination of blood and stools.

HOW TO TEACH

We have tackled briefly the issue on what to teach. The other question which is imperative is how to teach. In order to come up with a method which is appropriate we have to deal with curriculum designs: a design which can be adapted to our school which practice the integrated programme.

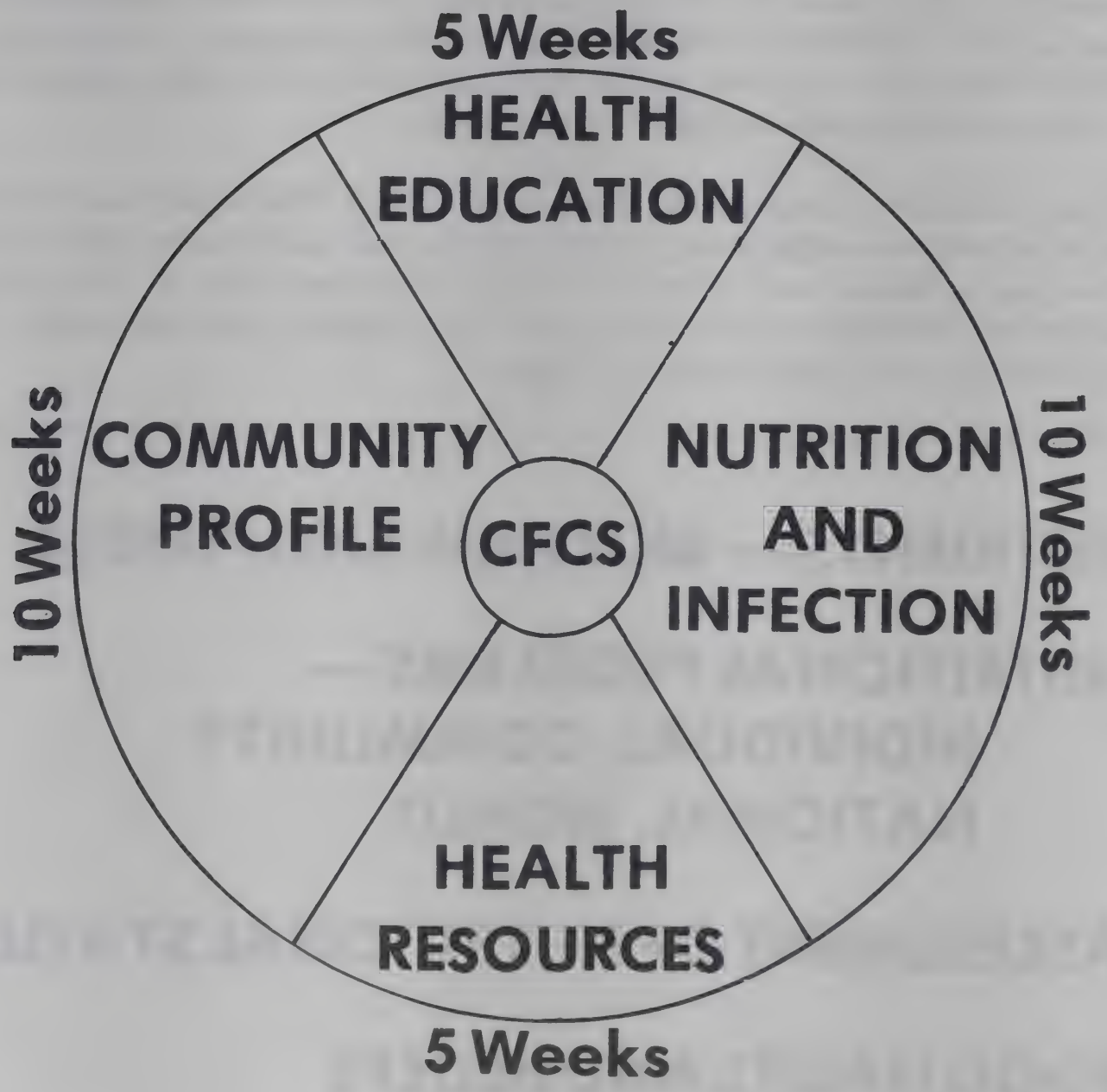

Fig. 2: Community and Family Case Study packages for Year 2.

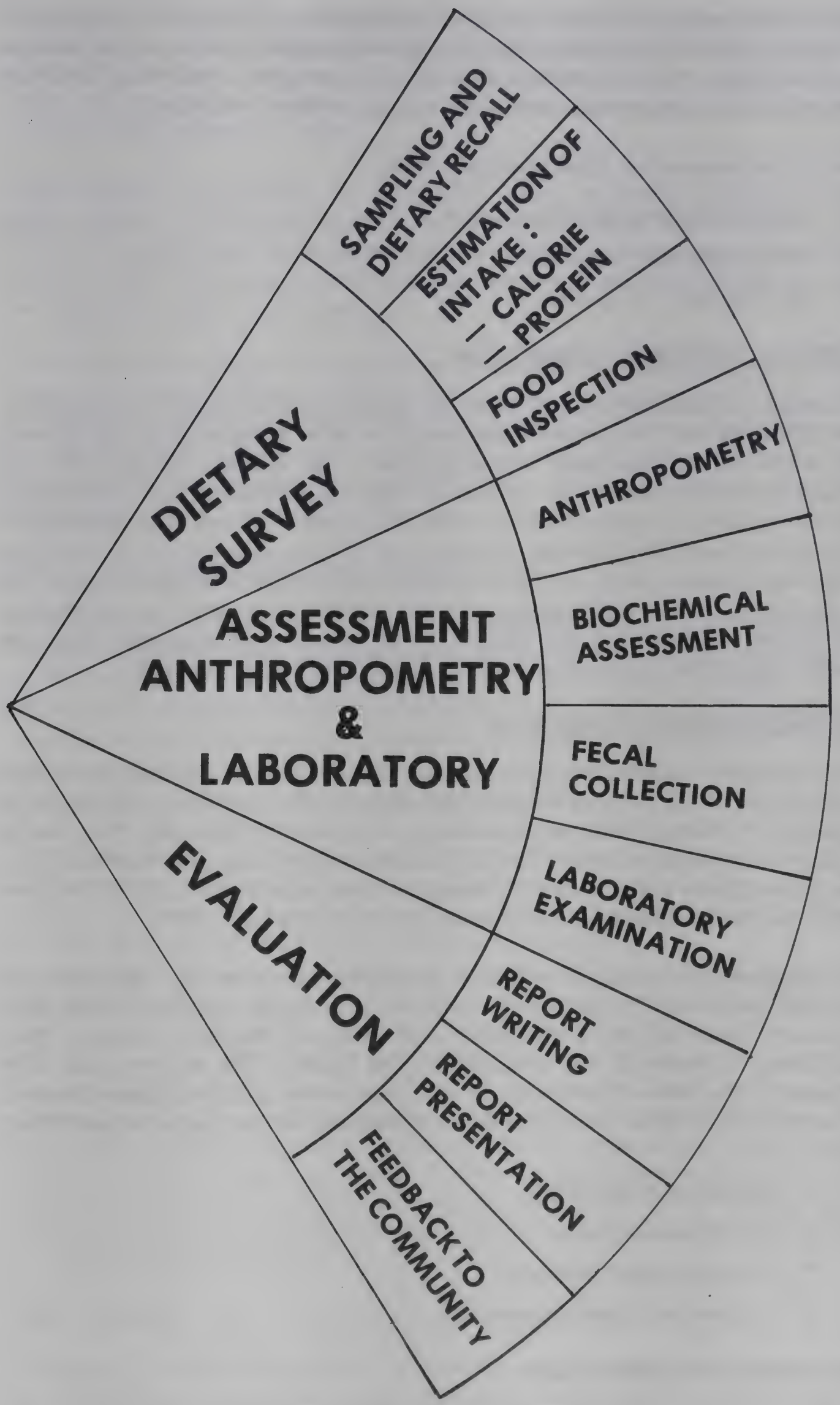

Fig. 3: Nutrition and Infection Package: 10 week Activities.

Curriculum Design is supposed to be an arrangement of instruction materials in a logical, internally consistent and having meaningful relation to one another (Griffin & Light, 1975). From my observation the scheme of teaching which are presently in operation in our school is a mixture of three main designs.

The 3 main designs are: (Griffin & Light 1975)

1. The Rational Empirical Curriculum
2. The Engagement Curriculum
3. The Emergent Curriculum

RATIONAL EMPIRICAL CURRICULUM

This design employs behavioral objective as the central focus of the curriculum. The school determine prior to implementation what is expected to be learned; the instructional objectives states precisely the course content and the behaviour of the student as a criterion of learning. Behaviour here emcompass various student activities which include his action, thinking and response in connection with the learning materials. It is also referred to as terminal behaviour (Mager, 1962). This form of curriculum design is a common practice in traditional schools with teacher centered pedagogy. However, in our Medical School we still maintain this design as one of the core blueprint. They are vividly represented in the form objective books for Phase I, II and III.

THE ENGAGEMENT CURRICULUM

The differences between the rational empirical and the engagement curriculum rest little with the body of content but more on the greater participation of students in selecting area of experience in curriculum planning. The role of student in this design is more flexible than the rational empirical method, "It is the responsibility of the student to engage in those activities which to him seem most reasonable, desirable and meaningful." (Griffin & Light, 1975).

The engagement curriculum will have guidelines which are less rigid than the Rational Empirical Design to help students in selecting and performing their activities. Both in the engagement and Rational Empirical Designs their guidelines for learning were prepared by the Faculty. The student's role is to respond in the form of behaviour or activities within certain accepted norms. Situations which allow the operation of the engagement activities in our school are:-

1) Small group discussion
2) Small group tutorial
3) Problem based learning
4) Community based experiences

THE EMERGENT CURRICULUM

In this design the student's role is central. The stimulus for instructions is the students themselves. The teachers role will be more of a guide and facilitator rather than a repository of knowledge. The lessons may start with a dialogue and

the students later decide what to do, say, decide on the topic of a group project of their choice. This process will allow the student to discover new things and deal with it in their own ways. This design is quite similar in principle to the Freirerian method of "Cultural Circles" in literacy campaign in Brazil in 1970 (Freire, 1980; Drummond, 1975).

The teaching of Nutrition in University Sains Malaysia, Medical School, emcompasses all three designs. Phase I Nutrition block mainly employs the rational-empirical approach. Some form of the engagement approach is being practiced too, especially in small group discussion where the students are being provided with various guidelines.

In the Nutritional and Infection package of the CFCS the three designs are being integrated and stressed in various areas. Lectures and examinations are usually in conformity with the rational empirical designs. Surveys and laboratory examinations are based on the engagement approach and their activities such as report writing and presentation are left to the students to determine on their own project which is emergent in nature.

WHAT TO MEASURE AND HOW TO MEASURE IT

Evaluation will have to follow the curriculum designs that is being implemented. For the rational empirical approach evaluation will see whether the objectives have been fulfilled and how much (MCQ & MEQ). For the engagement the objective is a little flexible and less technical. Rather than asking the students to recall what has been learned, the students are evaluated on their ability to apply and integrate the knowledge they had in a manner of case approach and problem solving. Say, given a case of a malnourished child, the question will be on what are the factors which lead to malnutrition and how to overcome them rather than going into technical details of the biochemical and physiological changes in malnutrition. In this case evaluation serve more as an instrument for redesigning the programme instead of a measurement of student's achievement. It is also an assessment of the level of skill development.

Evaluation for the emergent curriculum is very difficult since no objectives have been decided prior to the implementation. The evaluation question in this design will center around what methods of investigation the student uses and how effectively were they in achieving their goals? Staff guidance and observation may be useful in guiding the evaluation process. Student reports and presentation will shed some light into certain evaluation techniques. Figure 3 lists the activities carries out under the ten week-programme of Nutrition and infection package. The section on evaluation includes report writing, report presentation and feedback to the community , and is emergent in nature and requires student commitment.

CONCLUSION

The goal of Nutrition Education is to produce nutritionally healthy people and to establish good eating habits and intelligent food selection through out life (Contento, 1980; Bosely, 1947). New emphasis on disease prevention and promotion of good health in various countries makes Nutrition Education an important part of the integrated subjects in the Medical Schools (NRC, 1985).

The role of Nutrition Education is to provide the learner with nutritional knowledge and which ultimately will lead to improved nutritional status (Individual & Community). The learner can be a group of medical students themselves or the public at large. Nutrition education would be meaningless if students received the information at the cognitive level and never allow it to sink to the affective domain or if necessary the psychomotor domain. Figure 4 summarises the nutrition education conducted in Year I and Year II at our school.

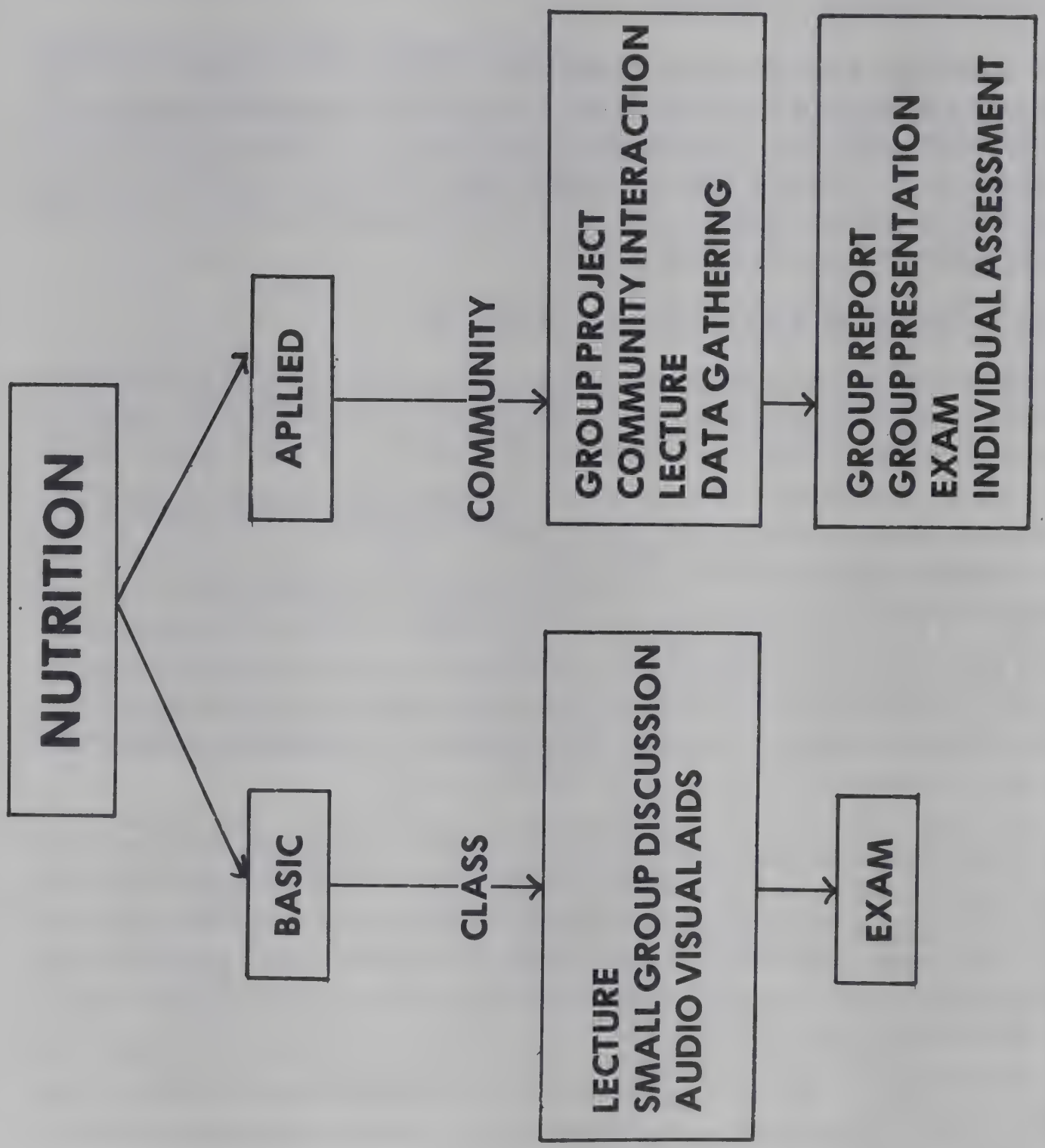

Fig. 4: Summary of Nutrition Education Activities in Year I and Year II at the USM Medical School.

I would also like to point out that we must be aware of the differences between training and education in achieving the goals of the school. To quote Ringness (1975):-

> '... 'training' refer to activities used by parents, teachers and other to produce thinking and behavior common to all — conformity. Such behaviors are largely prescribed and directed by the authority figure, reinforced, and otherwise externally controlled. External control and decision-making are used until the training has been accomplished.
>
> 'Education' demands inner direction and controls. It implies that a person makes his own decison, think for himself, considers alternatives, and projects the probable consequences of his choices of behaviour... Education implies a progression from activities directed by others to self-direction and acceptance of one's unique characteristics...".

In a new school of ours which practices an integrated approach in teaching and learning the balance between training and education should bę a form of 'homeostasis'.

Lastly, I would say that Nutrition education can play an important role in bridging the gap between the preventive and the curative aspect of medical education. However, great efforts are needed to ensure that integrated education will stay. One of the pressing problem for our students and staff is the lack of books in Bahasa Malaysia. Until such a time when enough books are available in Bahasa Malaysia we will still be handicapped.

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TEACHING MEDICAL ETHICS TO MALAYSIAN MEDICAL STUDENTS

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INTRODUCTION

Once upon a time practice of medicine used to be very simple. The medieval physician could watch half of a town dying of an epidemic and blame the victims for their great sin.

Today, the infant mortality rate has plunged down and the average life span has increased fifty percent; worn out parts are being replaced by new ones, and malfunctioning organs are being replaced by machinery. But physicians of today are being confronted with new situations for which there is no single right answer. The aim of his profession is no longer confined to saving life of a patient under his care. He is facing new questions. Can the population be allowed to grow without limit? Should the deformed embryos be allowed to survive? Must old age be prolonged at the cost of grace and dignity? Is he sure when life ends? He is confronted with dilemmas touching on religion, morality and philosophy.

Modern medicine has accepted the fact that the practice of medicine which is not based on ethical grounds is not medicine.

WHAT IS MEDICAL ETHICS?

The physician is constantly confronted with questions like, "What should I do?" or "What is the best course of action for me to take?" His solution to these questions will depend not only on his physiological and pathological knowledge, but will also include personal, familial, social, economic and political aspects of the quality of life. "Society expects physicians to feel strongly their own moral accountability for what they do and the reasons they have for their actions."[3] Consequently the physician should know and recognize his own "values". As a decision-maker, he must be "guided by value-related beliefs about human beings, medicine, and life; and these beliefs will largely constitute that physician's ethics."[3]

Medical ethics has several facets, one of which is Medical Etiquette or rules of intra-professional conduct. Another is Medical Law, which leaves little scope for individual interpretation. Both these facets are relatively straight-forward, unlike the third and most complex facet, Ethical Dilemmas. Unfortunately, there is no "decision procedure" in this aspect, and there is seldom one and only one solution; for example: the nature of doctor-patient relationship, or the criteria for determining quality of life. Majority of us perhaps find it comparatively easy to deal with questions of abortion or euthanasia, but difficulty arises with issues like confidentiality or selective allocation of expensive health resources.

In 1967, the General Medical Council of Britian felt that some sort of formal and probably compulsory teaching of analytic medical ethics should be provided within the medical curriculum and recommended that medical ethics be taught as part of the basic medical education.

The World Health Organization and in particular the Council for International Organization of Medical Science (CIOMS) recommend inclusion of broader issues in this field, e.g. medical research, public health policy and the national and international allocation of health resources, issues most doctors in their professional life have to face.[4].

The birth of the Journal of Medicine and Philosophy in 1977 is an evidence of an awareness that the philosophical basis of medicine needs to be emphasized.

WHAT SHOULD BE TAUGHT IN MEDICAL SCHOOLS?

Hicks[2] considers that education in ethics should not encourage students to expect certainty, because quick, complete answers are rare in ethics. Veatch[6] suggests that the main function of medical ethics may be not to encourage the confidence of physicians in making ethical decisions but to make them more aware of moral uncertainty.

The consensus opinion is reflected in Thung's statement, "Teaching ethics... does not mean impressing upon students the contents, the implications and the application of specific moral values. It rather means sensitizing them to the variety of moralities in our society and introducing them to the inquiry into the nature and implications of these different moralities."[5].

The student will then learn to use a consistant approach to ethical problem-solving based on an ability to critically analyse alternatives in full awareness of the social context and its norm.[1] This is more relevant in Malaysia, a multi-racial, multi-religious and multi-cultural society, with several competing sets of moral principles and values. The students in this context, should address factors, like increase of communication and interaction between different cultures. That will benefit both our patients and society and will avoid imposition of personal moral preferences.

Also, at the same time the students should "recognize their own attitudes and limitations, as well as the fact that they too may have hidden motives which should make them careful of imposing their views upon others."[5]

Attitudes are by no means fixed. Consequently value structures alter, with the person, over time.

The students and doctors should be aware of their own value structures and their contribution to the decision-making process. The value orientation of patients may also be in conflict with doctors' values. All these are matters of exploration which the students must undertake.

Medical ethics have only recently been introduced into the medical

curriculum at the Universiti Sains Malaysia. The programme spreads over the whole medical course with gradually increasing emphasis in the later years along with increasing patient contact. Issues in this field run parallel with Behavioural Sciences, Attitude Development Program, and Forensic Medicine.

Basic relevant issues in certain special topics, eg. religion, sex-education, holistic approach to medicine and so on are dealt with in Phase I. In Phase 2, ethical issues and dilemmas are built into Problem Based Learning. Topics covered include 'Complex question of justice', e.g. driving licence for epileptics, (in the Nervous System); 'Ethical uses of resources', e.g. dialysis and transplantation (in the Renal System); 'The control of the beginning of life — contraception, sterilization, and termination of pregnancy' (in the Reproductive System); and 'The patient's right to refuse hospital admission', (in the Psychiatry Block).

In phase 3, the input of medical ethics will be maximum. Topics included are: confidentiality; truth-telling; informed consent; patients you don't like; placebos and health; genetic engineering; and so on.

Students who have special interest in medical ethics, wanting to explore in greater depth, are free to choose a topic in the elective programme. Students who took the ethics elective in Monash University were found to be better able both to tolerate and to resist disagreements and ambiguity, as a consequence of the course.[2]

HOW TO EVALUATE STUDENT PERFORMANCE IN MEDICAL ETHICS?

The real difficulty in assessing a program of medical ethics is the absence of an established criteria. Some educators feel that it is not assessable at all.

Some others feel that the process of one's moral reasoning changes with the specifics of different ethical dilemmas.

But it is feared that if a subject is not assessed the students do not take it seriously.

Ewan [1] believes that if medical ethics is an important component of medical education, then, to some extent and in some fashion, it should be assessed. She suggests that it is difficult to assess the content of the students' ethical repertoire, but we can assess the process by which they arrive at ethical judgements and the extent to which they have learned to analyse situations, evaluate alternative actions and justify their decisions.

CONCLUSION

Medical Ethics offers considerable potential for the integration of the biomedical and psychosocial aspects of medicine.

The teaching of medical ethics should increase awareness and appreciation of complexities of medical issues and remove dogmatism.

The beginning has now been made in the Medical School, Universiti Sains Malaysia.

Hopefully, our physicians of tomorrow will have a solid grounding in ethics and will be able to make medical decisions in delicate situations based on their maturity, even when the solution is not provided in the Code of Ethics.

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EVALUATION

PROGRAMME EVALUATION IN THE DEVELOPMENT OF INNOVATIVE CURRICULA

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The three decades we have left behind us have seen significant changes in medical education. In the US, ever since Abraham Flexner made his influence felt early this century by giving medical education a scientific foundation, the medical curriculum remained relatively static until the late '50s, when the pioneering efforts at Western Reserve sparked off an era of change. The flurry of sporadic changes in North American schools was followed, though at a slower but more deliberate pace by schools in the UK, especially in the '70s, influenced perhaps by the Todd Report. Amidst all this change one commodity has remained in short supply — the evaluation of the effects of change. One could attribute many factors to this apparent dearth of evaluation, not the least of which is the reluctance of innovators to publicize their results. It is true to say, however, that no innovation can succeed if it has not built into it a system for determining the answer to the third vital question in that famous triad: "Where are we going?" "How do we get there?" "How do we know we have got there?" I would like to add to that: "How do we know we are getting there?"

The title of the address originally assigned to me by the Organizing Committee, focused on the Criteria and Objectives of Program Evaluation. I would address my remarks, in particular, to the situation that the School of Medical Sciences finds itself in: a new school attempting to implement a radically innovative curriculum, in a country which has for long based its system of medical education on a traditional British pattern, dictated by its close affiliations to the UK. In so doing, I hope some guidelines will emerge which would assist the School, as well as other schools represented here, to scrutinize and monitor closely what they do, and how they do it.

What, then, is evaluation? The very notion itself triggers a chain reaction of mixed emotions and vexed questions. Why? Because inherent in the concept is the feeling of being judged; and, basically, no one likes to be judged by others. Why are we reluctant to be judged? Because we are apprehensive that the criteria by which we are judged may not coincide with the criteria by which we wish to be judged, and which we value. And so has arisen the notion of self-evaluation.

This may sound as though the main reason for self-evaluation is our fear of being judged by others. Rather, the proponents of self-evaluation would argue that our chances of making decisions and acting on those decisions

are optimized if we have undertaken the evaluation ourselves. To come back to our original question — **evaluation** is the making of an informed judgement on, or assigning a value to, an object or event, based on data obtained from a variety of assessments or measurements. The evaluator's role is to assign that value, while the decision-maker's role is to act on it. It is of paramount importance to separate these two functions, as the evaluator who attempts to usurp the functions of the decision-maker would soon discover! However, the evaluator has a major influence on the decision-maker by virtue of the manner in which the evaluation is carried out and presented to the decision-maker.

The dual personality of many medical academicians has been pointed by Abrahamson (1977) in an Editorial in the Journal of Medical Education on Changing the Curriculum in the Medical School. He says, "They seem to respond to problems in their respective disciplines in a thoughtful and scientific manner, but approach problems in education with a ready-made simplistic solution." They respond to pressures by making ad hoc changes, and sometimes even keep going back and forth between innovation and tradition, without critically examining the effects of either. A case in point was the decision by some schools to shorten their curriculum (in the mistaken belief that this would result in a bigger output of physicians); and the subsequent reversion to the longer curriculum. Neither of these decisions was based on adequate study of intended or actual outcomes. At the other end of the scale is the "new orthodoxy" which seems to have developed in some innovative schools, where there has been a reluctance to review the efforts of the innovation, and the innovation of the past has become the tradition of the present.

The major objective of the medical school is the preparation of students for the practice of medicine in the most effective and efficient manner possible. The unique justification for the existence of the school and its support by society is its educational mandate. Any attempt to evaluate the medical curriculum, therefore, is incomplete, if it does not focus on this major objective. The USM School of Medical Sciences can, today, hold its head up with pride as it graduates its first batch of medical students, who, like all pioneers, have faced the hazards of unchartered territory. The real test, however, will be the manner in which they take their place in Malaysian Society and contribute to meeting the health and welfare needs of this society. Evaluation directed towards that objective will undoubtedly take time, as it is long-term in nature and fraught with contamination by variables not directly attributable to the curriculum. Yet it has to be planned here and now, or the School would never know how sweet or sour the fruits of its labour are. When Case Western Reserve changed from the traditional to a radically different curriculum almost 30 years ago, included in the plan for change was a follow-up of graduates from both the old and the new curriculum who had been in practice for at least 10 years. Graduates were tracked down and visited individually by a faculty member, who conducted tape-recorded interviews and administered questionnaires. While providing the graduates an opportunity to reflect on their medical education in relation to their professional experience, these visits enabled the faculty to observe the professionals in their natural settings.

How often have we paused to consider that the medical students we are training now will be practising medicine well into the twenty-first century? To what extent have we considered this in planning the curriculum? How will we know that we have been successful in preparing them for this role? Undoubtedly some of these issues will be discussed in the panel tomorrow. I raise them here mainly to stress the need for long-term evaluation if we are to find out the true worth of our curriculum.

While the importance of long-term evaluation is undeniable, it would be unwise to ignore the "here-and-now" component in any plan for program evaluation. One aspect of this component is what the expert calls "process evaluation", namely, the evaluation of the processes that go on within the curriculum. If I was permitted to select only one source for obtaining process evaluation data from, given a variety of potential sources, I would opt for the students. The students are central to all the processes that go on around them, and are the consumers of these processes. They know best how the processes affect them, and what pleasure and pain they gained therefrom. They have their limitations, no doubt, in the extent to which they can provide valid feedback on some aspects of the program, and evaluators need to be aware of their limitations before making judgements. Their comments are, however, most useful in areas such as their enjoyment, perception of relevance, degree of emphasis, appropriateness of readings, effectiveness of methods and perceptions of fairness in assessment, to name a few. I am aware that the School of Medical Sciences has, from the inception of its curriculum, paid particular attention to obtaining student feedback. I am also glad to note that recent graduates are to present their views of the curriculum later today. This practice is to be commended. Students give feedback both directly and through committees or representatives. It is particularly important to ensure that feedback obtained by the latter means is truly representative of the student body, rather than the opinion of the individual representing them.

The increasing use of self-assessment by staff, particularly in the more progressive schools and the disadvantages accruing therefrom, have been alluded to earlier. Faculty need assistance in developing methods of self-assessment which are as objective as possible, free of the biases which such instruments are obviouysly subject to. They need help in identifying what particular aspects of their teaching both they and the students have most concern with, and to devise instruments which specifically address those concerns.

Of all the categories of process evaluators, the external evaluator is perhaps the most threatening. Not only is he a foreign body to be extruded as soon as possible with the least damage to healthy tissues, but he is also likely to be the prophet of doom (based, of course, on his own value system). The external evaluator faces problems in acceptance. I recall a particular incident on one of my many visits to the school. My task was to examine the processes taking place in Phase 2 of the curriculum, and towards this end I sought permission, from staff and students, to observe the problem-solving sessions that students were engaged in at the time. One particular tutor indicated to me that the students were reluctant to let me sit in. I suspected that the apprehension was more on the part of the tutor than the students. I went back to my office to attend to some other work. However, it so happened that this office was

separated from this particular tutorial room by a very thin wall, and I could not help but eavesdrop on the "mini-lecture" that the tutor engaged in for the entire two hours, under the guise of problem-solving. The tragedy was that I could possibly not feedback to the tutor my concerns about the session without revealing my misdemeanour! So much for unobtrusive evaluation! On the other hand; I subsequently observed a problem-solving session conducted by another tutor, (after permission of course), and was pleasantly surprised by the skill with which discussion was facilitated in this group.

The role of the external evaluator has also been of concern to medical schools in countries which are, or have been, in the Commonwealth. Medical schools in these countries have been largely fashioned on the British model of medical education, and many of them value recognition of their degrees by the General Medical Council. The Council periodically reviews these curricula through what is euphemistically called a "visitation". Implicit in such reviews is often an implication that there exist international standards of medical education. This, I submit, is a figment of the imagination. How could international standards exist if medical education is to be geared to the needs of the particular society in which the medical school finds itself in? Tan Sri Khalid, in his opening keynote address, referred to the fact that the Council of Ministers of the European Economic Community were unable to agree on national or international standards, so as to permit the free flow of doctors throughout the Community. How, then, can common standards apply to, say, Malaysia and the U.K.? In a careful analysis of the issue of standards in medical education, Abrahamson concluded that it was difficult to identify national standards and that there were no true international standards of medical education, with regard to curriculum content, student selection, staff : student ratios, teaching processes etc. However, he concluded that if the concept of international standards was restricted to "rational, national curriculum planning and a solid scientific substrate of medical education", the debate might shift to a more important plane.

The next component of evaluation I would like to dwell on is evaluation of the immediate product, i.e. the competence of the graduate at the end of training. This seems to be the most widely used yardstick of curriculum effectiveness, but unfortunately, subject to many misuses.

In 1968 the Harvard School of Medicine introduced a radically new integrated core curriculum organized around organ systems and which allowed for 17 months of elective time. The scores of the first class under the new curriculum in the National Board Part I exam, given at the end of the second year, fell significantly from the prestigious position this School had attained previously, resulting ultimately in the dismantling of the controversial curriculum soon thereafter. For critics of the core, disappointing National Board performance became an important weapon with which to fight the new curriculum. At the University of Pittsburgh, however, persistence with the changes, in spite of apparent poor performance initially, resulted in a gradual recovery without further significant curriculum adaptation.

National exams are, perhaps, the single most powerful deterrent to curricular innovation. The National Board exams were never intended for the purpose of

evaluating curricula and curricular changes. They assume a degree of uniformity across schools which militates against innovation, encourages tradition.

I visited McMaster in 1973 and again in 1983. The concern that students even in this "enlightened" medical school have over the LMCC impressed me as a genuine concern for anyone who wishes to practice medicine in Canada — a concern that cannot be ignored. However, to abandon a curriculum which has proved its worth on the grounds of inadequate performance in a national exam is unthinkable. Be it to the credit of the faculty there that they have found other means of allaying this student anxiety than curricular change.

I would, however, like to pose a question here. Given the same objectives, should not their achievement be better through a curriculum based on accepted principles of learning than one that is less so? How then can poor performance in national examinations be explained? Perhaps the reason lies in the nature of the instrument, which may not be appropriate to the relative emphases placed on the same objectives. This is a case, then, for reform of the measuring instrument than the nature of that which is measured.

Some studies have sought to establish controls in curricular experimentation, where only parts of the curriculum were changed, and performance measured before and after the change in all the components. The danger here lies in the fact that the curriculum is a system, and any change in the system affects the whole system. Thus if Anatomy changes and Pathology does not, the effects of the former will be felt even in performance in the latter.

A common practice in many schools is to judge the effectiveness of a curriculum on the performance of students at internal examinations. I know of faculty members who are so apprehensive of a high failure rate that particular care is taken to prevent such. This practice is most undesirable. Performance in examinations is based on many factors, and the calibre of the student is only one of them. Undue emphasis on examinations only helps in creating an exam-oriented student body, which could well negate effective learning. In the same vein, the practice of dependence on external examiners deserves utmost caution, in a radically different curriculum. As Moy (1979) points out "the unusual academic structure... is often a concern to faculty members from traditional medical schools, who find themselves visiting new schools as part of accreditation survey teams". I happened to be one of several external examiners in the first ever internal examination conducted by this School and remember having a hard time convincing one or two of my colleagues how unfair it was to compare students sitting the first professional exam here with those sitting their first medical exam in a traditional school. External examiners need to be thoroughly familiar with the philosophy of the School and the objectives of the course they examine in before they pass comparative judgements on the calibre of students.

I have stressed the need for formative as well as summative evaluation of the curriculum, and pointed out the short-term and long-term nature of the latter. I have examined some criteria that continue to be used in curricular evaluation, and indicated the advantages and disadvantages inherent in the use of these

criteria. By way of summary, I would like to present to you an often used model of evaluation which I have found particularly useful, namely, the CIPP model of Daniel Stufflebeam (Stufflebeam et al, 1971). The eponym stands for Context-Input-Process-Product. The model is illustrated in the figure, and includes both on-going (formative) and terminal (summative) evaluation.

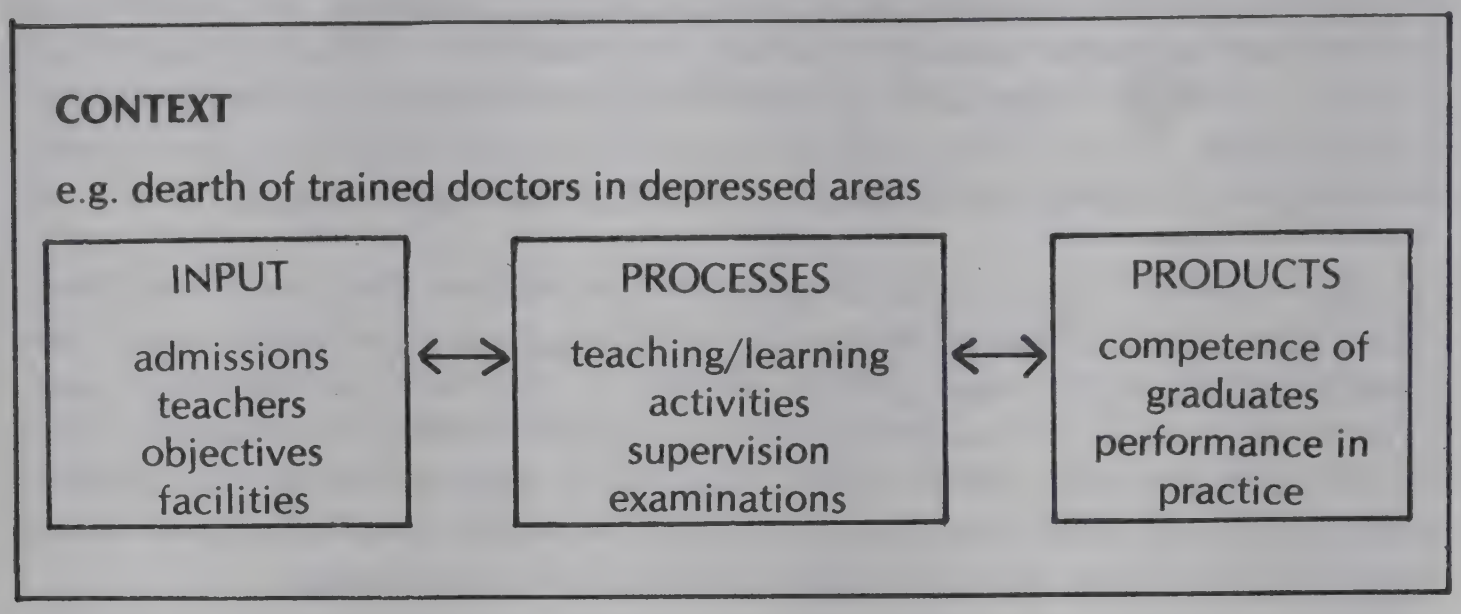

Fig. A C.I.P.P. model for evaluating training programmes.

Evaluation involves, firstly, identifying and confirming the concerns expressed about the program or its effects. Once confirmed, reasons for their existence would have to be sought. This includes evaluation of the product, and of the context in which that product functions. Evaluation of the context involves such factors as administrative support, reward systems and availability of time. Evaluation of the product involves the competence and actual performance of the graduates of the program. If a deficiency is found in the product, then a process evaluation of the program is undertaken to determine what was wrong or deficient in the way in which the program was implemented. In the RTTC we have developed a model for analyzing learning deficiences within a program by systematically examining the processes that go on in it, i.e. the nature of students selected, the capability and credentials of the teachers, the appropriateness of the program objectives and the nature of the facilities.

I would like to end with a quote from McGuire: "Use **product** evaluation to sound an alarm when something is wrong, and **process** evaluation to try to determine what is wrong."

Mr. Chairman, ladies and gentlemen! I was honoured to be associated with the first international workshop on medical education conducted by this School in 1981, before its first intake of students. Since then I have, through intermittent visits, seen this infant grow through its weaning and teething problems, and there were many. Perhaps the most difficult period was adolescence, when the first tentative move was made to Kubang Kerian. I am honoured to be present again at this conference to mark the occasion of the graduation of its products of adulthood. Are we going to let these products face the hazards of society by themselves? Or are we, through follow-up, going to support them and help them become the

leaders of the future, while obtaining feedback to help us do what we do better? As Dean Roslani pointed out in his welcome address, the task ahead is long and ardous. I hope this Conference is the impetus to that task, the outcomes of which will be the cynosure of many other medical schools in this region.

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STUDENT CHARACTERISTICS ON ENTRY TO MEDICINE AND OVERALL COURSE PERFORMANCE

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SUMMARY

A prospective study of students entering the Queensland, Australia medical course was commenced in 1979. Two successive entry classes, about 450 students in all, have been followed by regular questionnaires through to course completion or withdrawal from medical studies. This paper examines the hypothesis that overall performance in the medical course can be predicted from entry characteristics, including social and demographic features, and prior academic attainments. It is concluded that previous scholastic achievement is the dominant predictor of both medical course performance and continuation rate, or conversely, of withdrawal from the course.

INTRODUCTION

Methods of selection of students for Medicine have been the subject of widespread debate in recent times. At the University of Queensland, Australia, most students enter the medical course upon completion of secondary school. Selection of the main quota of 215 students is based on secondary or high-school performance, and is made from about 1,200 applicants. There is a sub-quota of 15 students, chosen from about 300 applicants who have undertaken previous tertiary study.

The medical curriculum underwent a significant revision in 1978 - 79[1], and the opportunity was taken to evaluate, throughout the course, 2 successive intakes of students — about 450 in all. The present paper compares demographic and social characteristics of students at the beginning of the course together with levels of scholastic achievement at the point of entry, with overall performance in the 6 years of the medical course and withdrawal rates during the course. The hypothesis — that course performance may be predicted from entry characteristics — was thus examined.

The results of the study show that a method of selection based solely on academic rating continues to have merit.

MATERIALS AND METHODS

The University of Queensland provides the only medical school for a State of approximately 2.5 million people. The medical school is 50 years old and offers a 6 year course in which students progress through a year of basic sciences, 2 years of pre-clinical sciences and 3 years of clinical work. The graduate is required to complete a year of internship in a teaching hospital before full registration as a medical practitioner.

Secondary school performance is assessed both within the schools and by interschool tests. Students are placed in order of merit, and their positions defined as between half-percentiles of all 17-year-olds in the State. Thus those above the 99th percentile, or top 1 percent of students are awarded a tertiary entrance score of 99, multiplied by 10 for simplicity or 990. Those between the lower half percentiles will receive scores of 985, 980, 975 etc.

At the start of the course in 1979 and 1980 all students provided social and demographic data, as well as information on attitudes and expectations. Evaluation has continued over the last 7 years and most of the students have now completed their studies. The present report is based on the main quota, i.e. school leavers, and does not include those who, at the time of writing are still to finish the course. "Withdrawals" include students excluded because of failure, and those who withdrew because of loss of interest or motivation as well as cases of prolonged illness or death.

Cumulative grade point averages (GPA) have been determined for the whole course. All components of the course are graded on a 7 (High) to 1 (Low) score, with 4 as a satisfactory pass.

Components are weighted only in relation to the hours of work nominally ascribed to each.

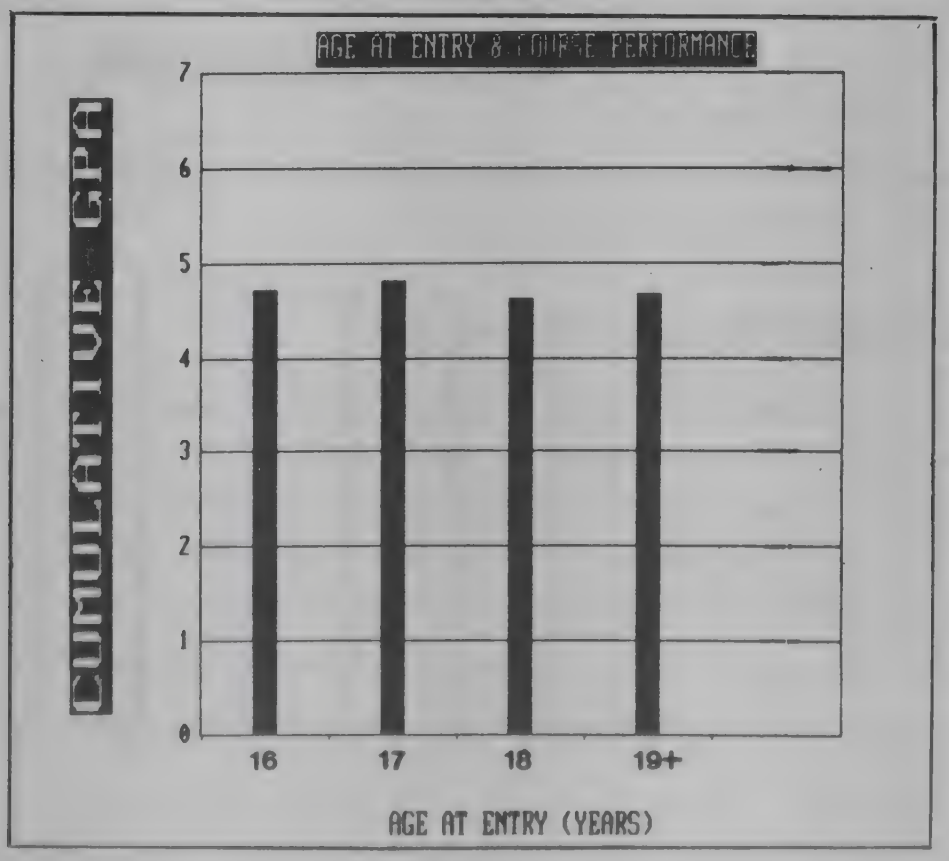
RESULTS

1. Age of Entry

Since most entering students are school-leavers, the most common age of entry to Medicine is 17 years. Figure 1 shows that there was no relationship between age at entry and cumulative GPA over the whole course ($F = 1.82$; $p > 0.10$).

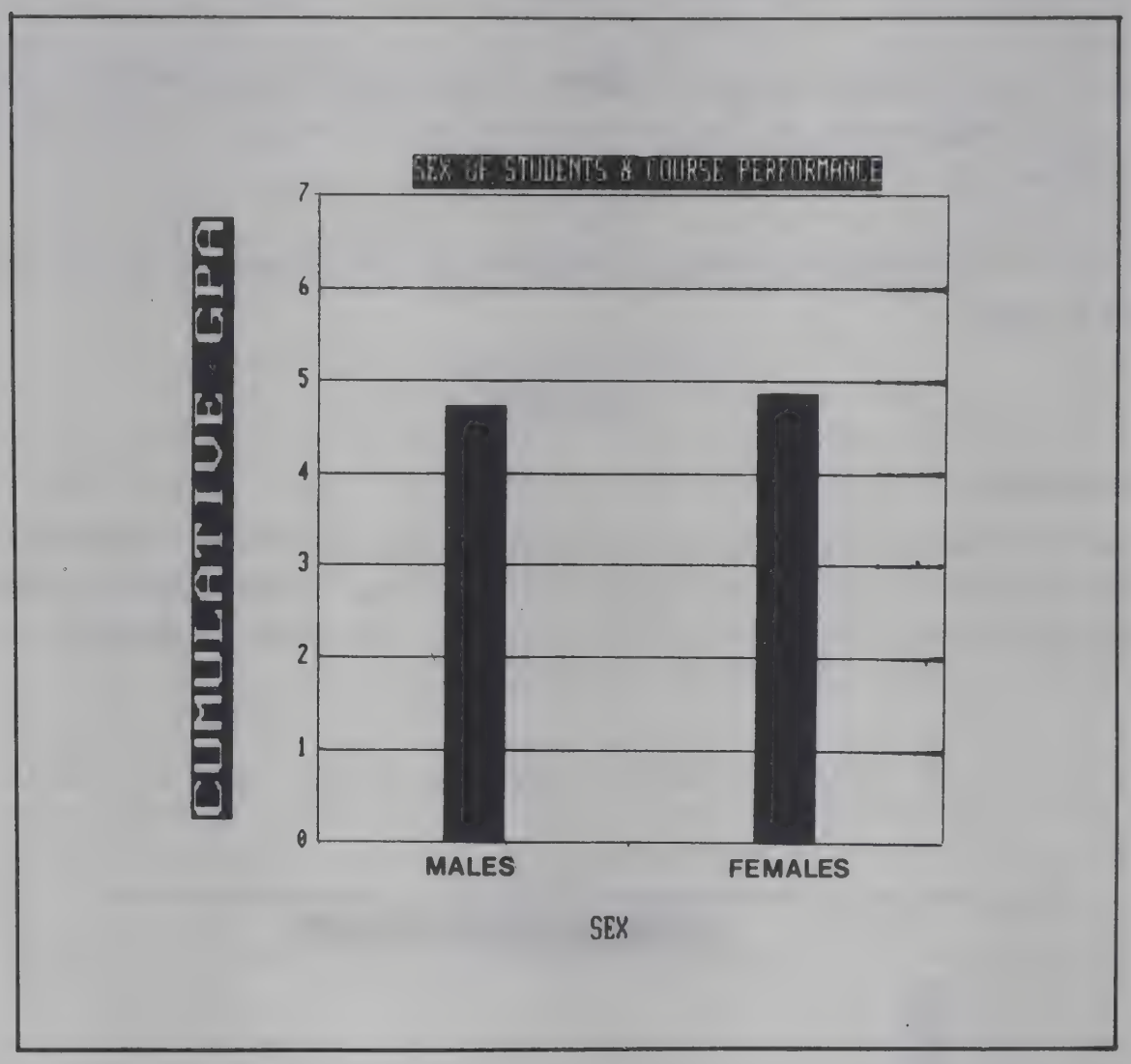
There was similarly no relationship between age at entry and withdrawal rate.

FIG. 1



The average proportion of male students in the entering class over the last 10 years has been 63%. There has been a small but sustained increase in female numbers in recent years and the proportion of males in 1986 was 57%. The proportion of males in the study group was 69%. Figure 2 shows a slightly higher mean cumulative GPA amongst female students. The difference is not significant ($t_{346} \backsim z = 1.77$; $p > 0.05$). There was no difference in withdrawal rates of males and females ($x^2_1 = 0.89$; $p > 0.25$).

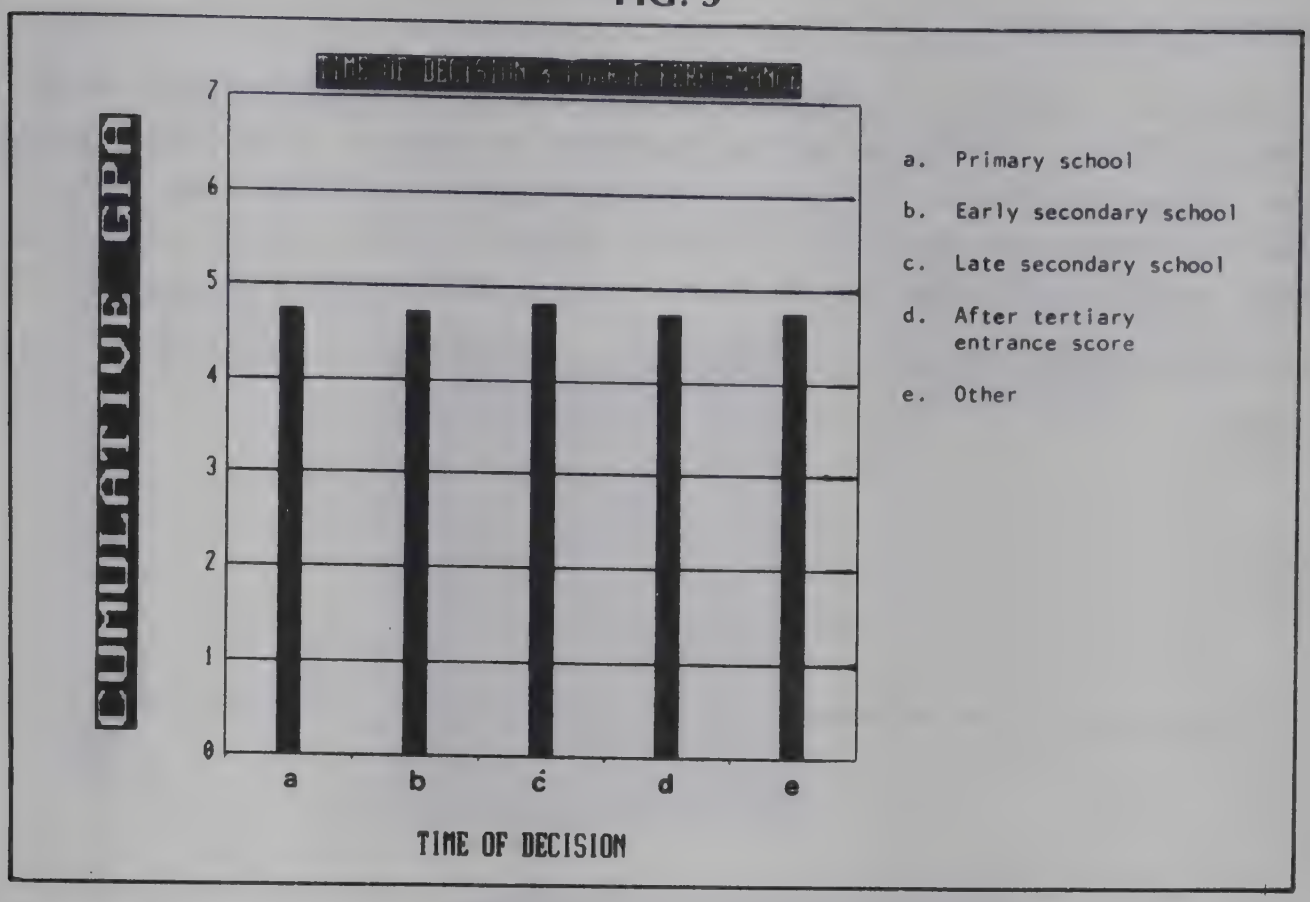
FIG. 2



3. Timing of decision to apply for Medicine

The timing of a student's decision to seek entry to Medicine has often been seen as a measure of understanding and determination, and thus of likely success. Figure 3 shows that there was no relationship between course performance and time of decision, whether this was many years before entry, or only months, as when taken after the tertiary entrance score became known. ($f_{3,343} = 0.40$; $p > 0.50$). There was likewise no relationship between time of decision and withdrawal rate (omitting "other", $x^2_3 = 5.11$; $p > o.1$).

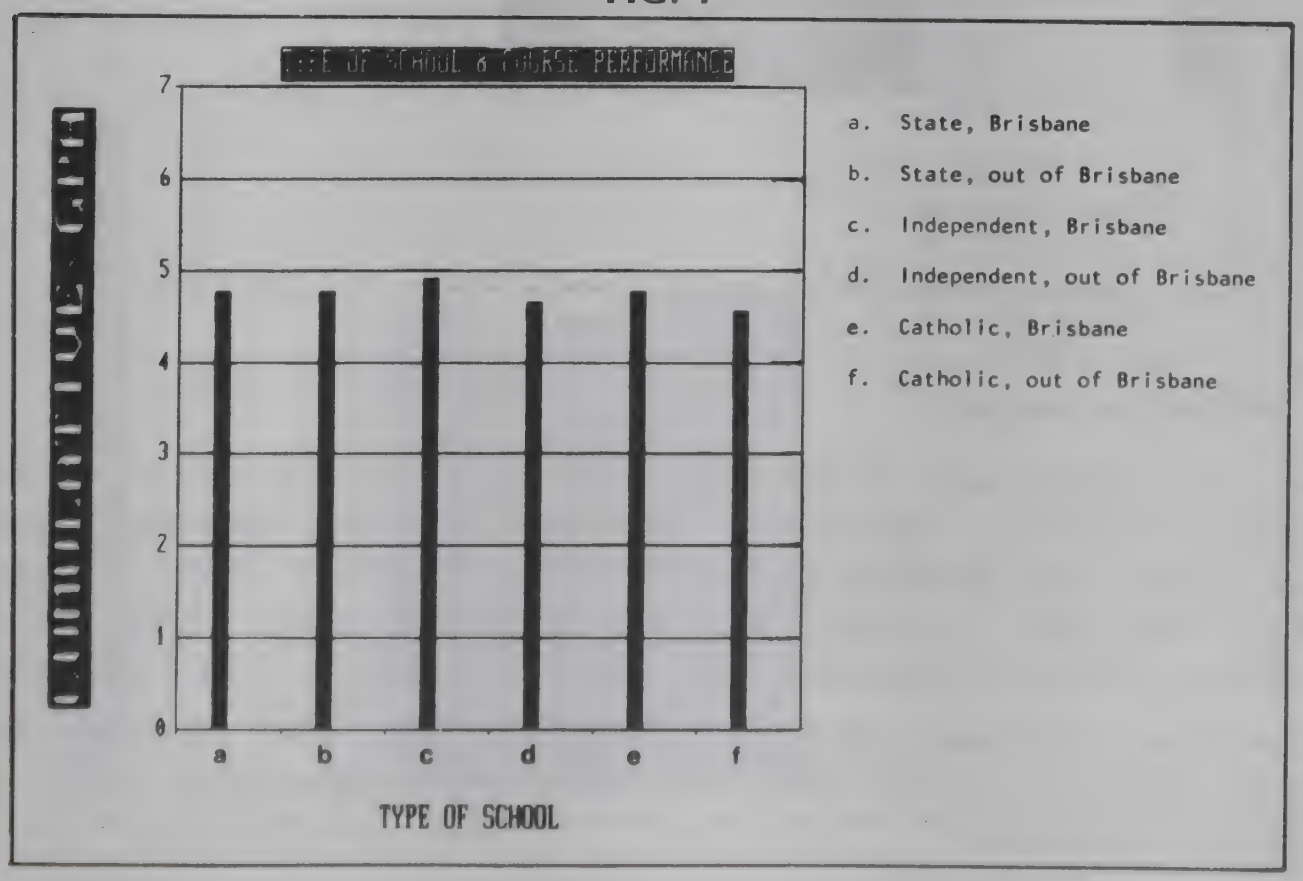
FIG. 3



4. Type and location of secondary school

Queensland is a large State, measuring 2,000 kilometres from north to south and 1,500 kilometres from east to west. About half of the population of 2.5 million lives in or near the capital city, Brisbane, but there are many provincial centres and smaller towns with secondary schools. Secondary schools are of 3 main types, State, or government, independent; and those run by the Catholic church. Analysis of schools attended by entering medical students shows no difference in overall performance in the medical course ($F_{5,327} = 1.48$; $p > 0.10$) (Figure 4). There was no relationship beyween type or location of school and withdrawal rate ($X^2_5 = 4.60$; $p > 0.25$).

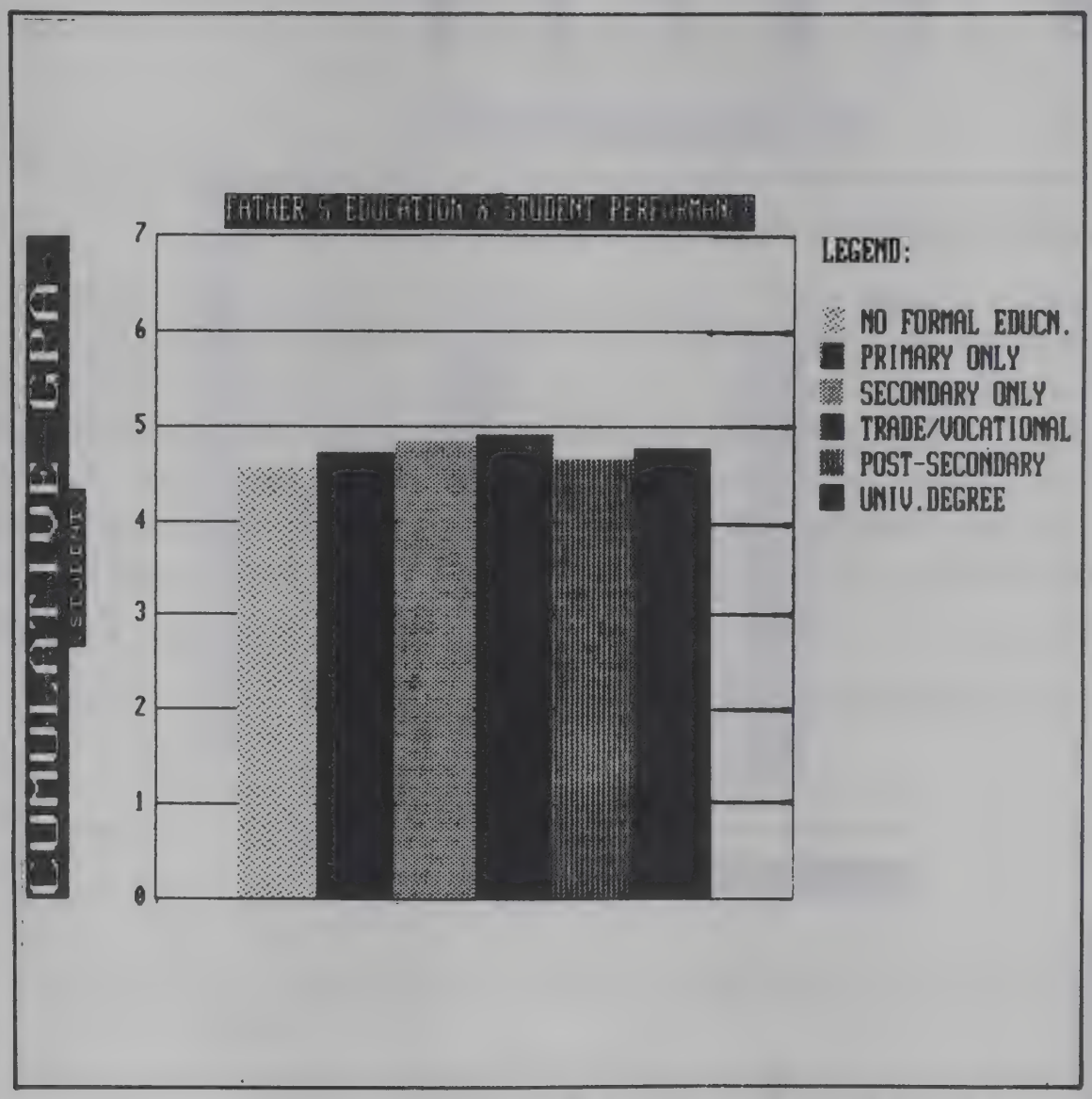
FIG. 4



5. Father's education

New medical students were asked about their parents' highest level of education. There were about equal numbers of fathers who had achieved primary, secondary, trade and post secondary education. More than twice this number of fathers had gained a university degree. There was no relationship between father's education and student's course performance ($F_{5,334} = 1.01$; $p > 0.25$) (Figure 5) or father's education and withdrawal rate ($X^2_5 = 9.11$; $p > 0.20$).

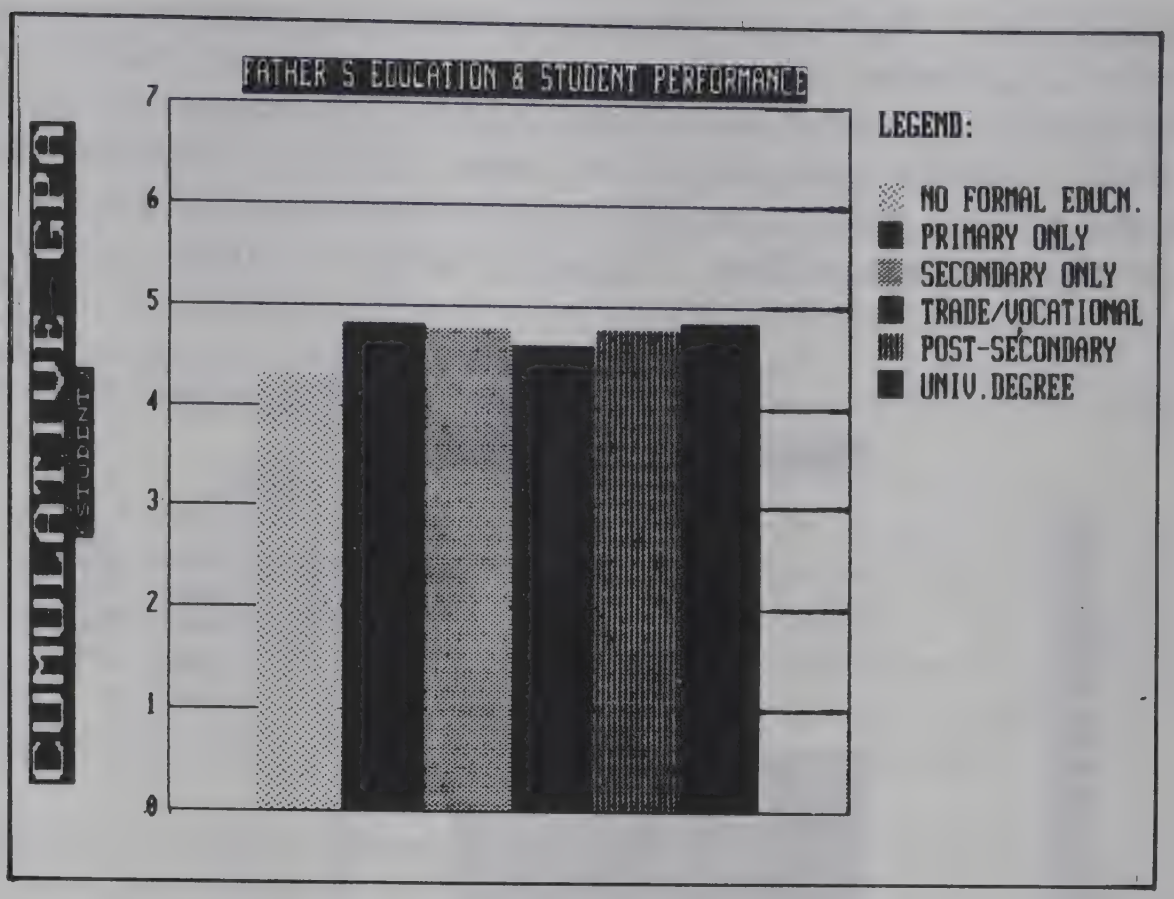
FIG. 5



6. Mother's education

There was a wide range in the educational attainment of mothers of new students. The largest number had completed secondary education; about equal numbers had achieved primary, post secondary and university degree levels. There were 5 mothers with no formal education. There was no significant differences in student performance ($F_{5,332} = 1.13$; $p > 0.25$) (Figure 6) or withdrawal rate ($X^2_5 = 3.68$; $p > 0.50$) when compared with mothers' educational levels. This lack of association was true for both male and female students.

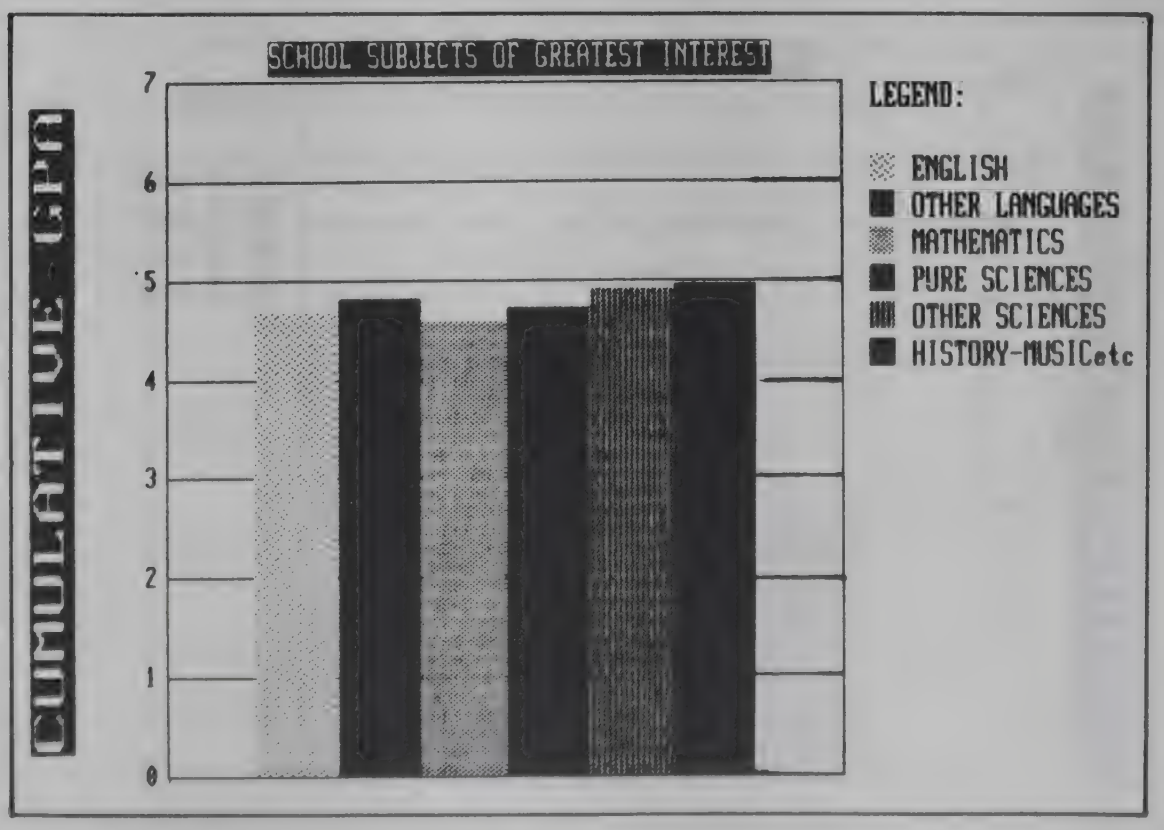
FIG. 6



7. School subject of greatest interest

Entering students were asked to name the school subject in which they had found the greatest interest. Since prerequisites for entry to medicine include science and mathematics there was understandably a high response under these headings. Figure 7 shows that students whose interest was especially in history and music had the highest level of medical course performance, followed closely by students with the greatest interest in "other sciences", defined as biology or geology. There was a significant difference between subjects in course performance ($F_{5,339} = 2.50$; $p > 0.05$), but not in withdrawal rate ($X^2_5 = 3.03$; $p > 0.50$).

FIG. 7



8. Tertiary entrance score

As described above, the tertiary entrance score is a measure of academic achievement at secondary school — specifically on the last 2 years. Entry to Medicine over the last 8 years has required a place above the 97½th percentile i.e. a tertiary entrance score of 975 or more. Figure 8 shows the relation between secondary school achievement and overall medical course performance, which is highly significant. ($F_{3,338} = 12.04$; $p < 0.01$).

FIG. 8

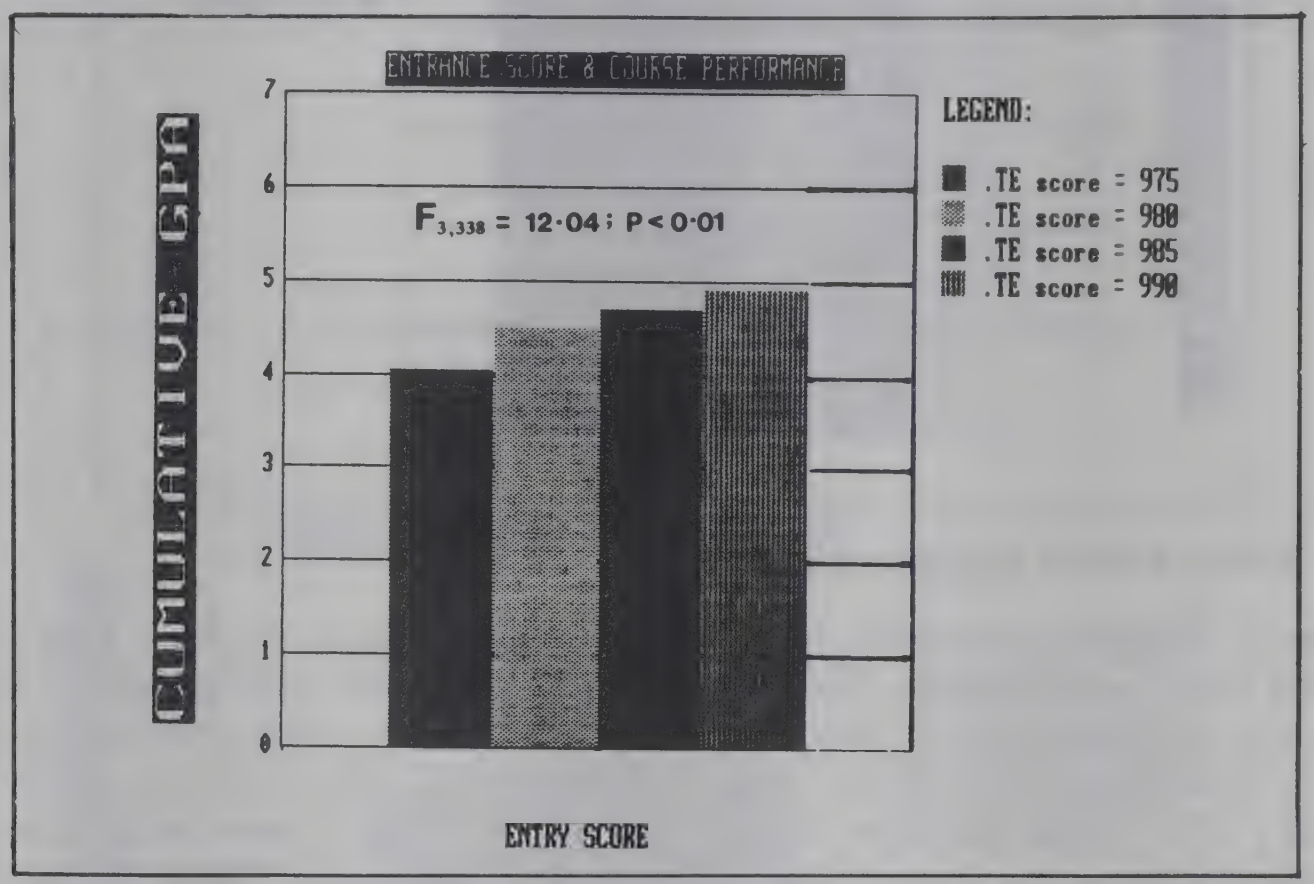
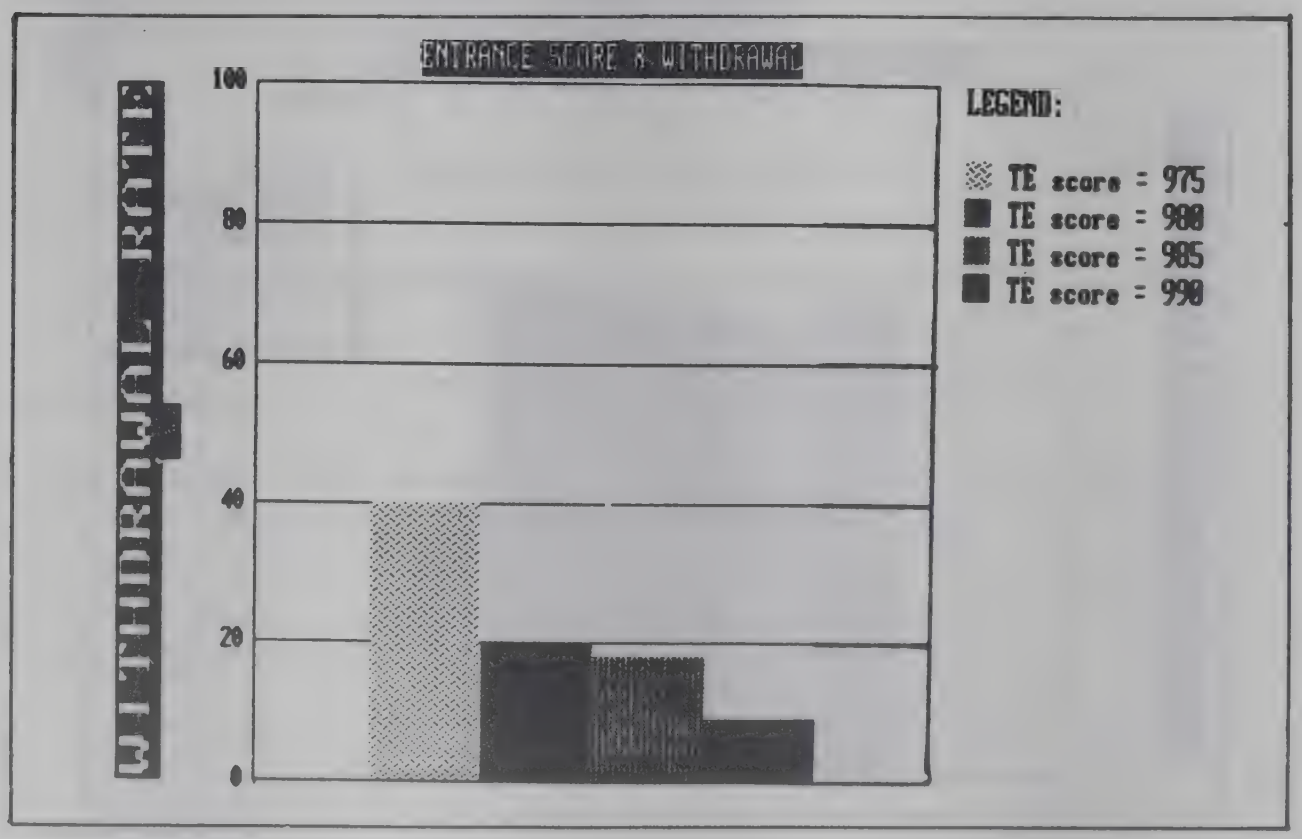


Figure 9 shows a relation between secondary school achievement, as measured by tertiary entry score, and withdrawal at any stage during the medical score that is also highly significant. ($X^2_3 = 16.2$; $p < 0.01$; $T_b = -0.17$; $p < 0.001$).

FIG. 9



CONCLUSIONS

Of all the entry characteristics examined in this study, only two are of any value in predicting overall course performance; only one is of value in predicting withdrawal rate, or conversely, successful completion of the course. While the secondary school subject of greatest interest has some value as a guide to medical school results, only the level of secondary school achievement gives a useful prediction of eventual success. The study reinforces the value of academic merit in the selection process for Medicine. It makes no comment on the suitability of academic merit as a guide in choosing students who will make the best doctors.

A cardinal feature of medical training is the wide range of career paths that may be taken after graduation and it is asserted that no single measure of success is applicable to all of these fields. Measures of career performance such as success in internship or residency posts, or in applications for speciality training positions have relevanve to only small sub-sets of a graduating class, and much more study is needed of this area.

Using the yardstick of success in the standard part of a medical career — the undergraduate course — the only characteristic in this study which was of assistance in selecting students to perform at a high level, and to complete the course, was academic achievement at secondary school.

FIG. 1: Age of entry and mean overall course performance.

FIG. 2: Sex of students and mean overall course performance.

FIG. 3: Timing of decision to enter Medicine and mean overall course performance.

FIG. 4: Type and location of students' final secondary school and mean overall course performance.

FIG. 5: Father's highest level of education and students' mean overall course performance.

FIG. 6: Mother's highest level of education and students' mean overall course performance.

FIG. 7: Students' school subject of greatest interest and mean overall course performance.

FIG. 8: Tertiary entrance score and mean overall course performance.

FIG. 9: Tertiary entrance score and rate of withdrawal from the medical course.

EVALUATION OF ANATOMY CONTENT IN AN INTEGRATED CURRICULUM

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Abstract

The documents of the University of Gezira include a lengthy questionnaire which is aimed at probing the opinion of different specialty groups among basic scientists and clinicians on the content of the "Human Anatomy Curriculum" for medical students. This is judged by the importance of the "content" item and the basis for that importance is the relevance to common and serious health problems as viewed by respondents. From the results obtained the "Anatomy Curriculum" could be defined and then further translated into specific behavioural objectives to form the basis for teaching.

A modification of this document is hereby suggested in order to set an evaluation methodology for the content of a particular course in Anatomy. This modification is founded on the relationship of the content item to different types of problems as well as to the degree of indispensibility. The product of these two variants (applicability and indispensibility) constitutes the score, showing the priorities of the various components included in the questionnaire. The degree of 'coverage' of major components of a discipline can be added to provide a further step in the evaluatiuon of the whole discipline content.

Introduction

There is a belief, among anatomists, that almost every piece of detail in human anatomy, in the undergraduate textbooks may be useful in some of the different clinical practice disciplines or in research. It is universally agreed that it is impossible to convey and assimilate everything in the traditional syllabus. Also, there is constant pressure to induce new subjects (e.g. electron microscopy) and materials in addition to, or at the expense of the more traditional content.(1) Emphasis on indispensible or 'main thrust' content for undergraduates has been considered by many schools. The idea was that a cognitive map containing all vitally relevant information helps the assessment and evaluation of knowledge. The decision on a cognitive content in anatomy requires multidisciplinary consultation to avoid extraneous input, usually chosen by basic scientists and at the same time, decrease reliance on the clinicians' impression which may either emphasize the mechanical aspects of their professional practice or over-instruct in their subspeciality anatomic detail (i.e. Otorhinolaryngological anatomy).

A great deal of discussion has taken place at the University of Gezira over the traditional method of determining content in basic medical sciences. This has

led to the defining of an outline (or list) of defects which might have resulted in content overload. At this institution problem-based learning is designed to partially solve the content volume-directed instruction; the student centred programmes aim to replace the teacher role models as a content reservoir and specific objectives isolate irrelevance.

Aim of the present document

In order to select a list of comprehensive highly relevant objectives, it is important to screen an initial heterogenous collection of items. The document is intended to list the anatomic items and outline the criteria for the selection of a final list, consisting of issues that stand high in terms of "values" according to the school's philosophy.

Technique for determing content

Previous attempts

The earliest questionnaire type' technique of screening a collection of subjects was that of Spivey [2–3] who assumed that individuals with multiple background give a more appropriate list of minimal acceptable performances to be achieved by undergraduate students. He has included specialists, general practitioners, medical educators, students and intelligent laymen. The curriculum so defined was flexible and tailored to meet the philosophies of many schools but the issues investigated were so broad that only general objectives could be derived. The items of the questionnaire were classified as (1) essential, (2) desirable but not essential (3) useful but should not be required, (4) of no importance and (5) I have no basis for judgement. McCarthy and co-workers [4] utilized this technique to assess its appropriateness and to outline undergraduate content in Ophthalmology in Australia. The questionnaire consisted of general items of ophthalmological practice, Earlier Worthen [5] surveyed the opinion of physicians of Florida on 18 ophthalmological items and reported absolute agreement with Spivey's results of 1970. The items of Worthen were more specific behavioural objectives covering the undergraduate ophthalmology course.

Gezira Technique

This has been developed by mutual interdisciplinary discussion with all teaching staff. In the formulation of each single objective the criteria for judgement were (a) the degree of importance of the items and (b) the basis for that importance. A list of anatomic items covering the possible course is included in the Anatomy Content Questionnaire (ACQ). [6]

First Criterion

The ACQ uses a classification, in its first criterion, similar to that of Spivey. The classes were (1) absolutely necessary, (2) very important, (3) important, (4) slightly important and (5) unimportant. The class "I don't know" or "have no basis for judgement" has not been included as it is anticipated that respondants from various disciplines (except for Anatomists) will find most of the questionnaire irrelevant for their specialty. The terminology of the items

listed in the questionnaire does not allow non-medical educators or intelligent laymen to respond and are therefore not included in the background sheet.

Second Criterion

This attempts to ascertain the reason for importance of the item. The basis for that is relevance yo health problems which are classified into (1) common as well as serious, (2) common, (3) serious, (4) for its own merits and (5) undecided or inapplicable. The class "for its own merits" is intended for respondents who feel that the item is of importance but cannot exactly relate it to a problem. From a practical experience we may say that the concept is rather loose and unless a respondant is intensely involved in integrated curriculum discussions, he or she may lose the thread relating basic scientific material to problems.

Nevertheless, "absolutely essential" items which are encountered in the "common" and "serious" health problem can be clearly defined by this questionnaire. Meanwhile, it is expected that some subsidiary and general outcomes may be derived by relating the impact of the respondents' specialty and affiliation to their responses. Basic medical scientists who are not medically qualified are at a disadvantage in responding to the second criterion, and their interest in the first criterion can be scored separately.

Affiliation and Responses

One aspect of the questionnaire focussed on the relationship of the specialty to the responses obtained, from Anatomists, Radiologists, Surgeons, Pathologists and others. From this list, Anatomists responded to more items and with higher scores of importance. This was expected. But, surprisingly, Radiologists came next, and the Surgeons were third (Fig. 1).

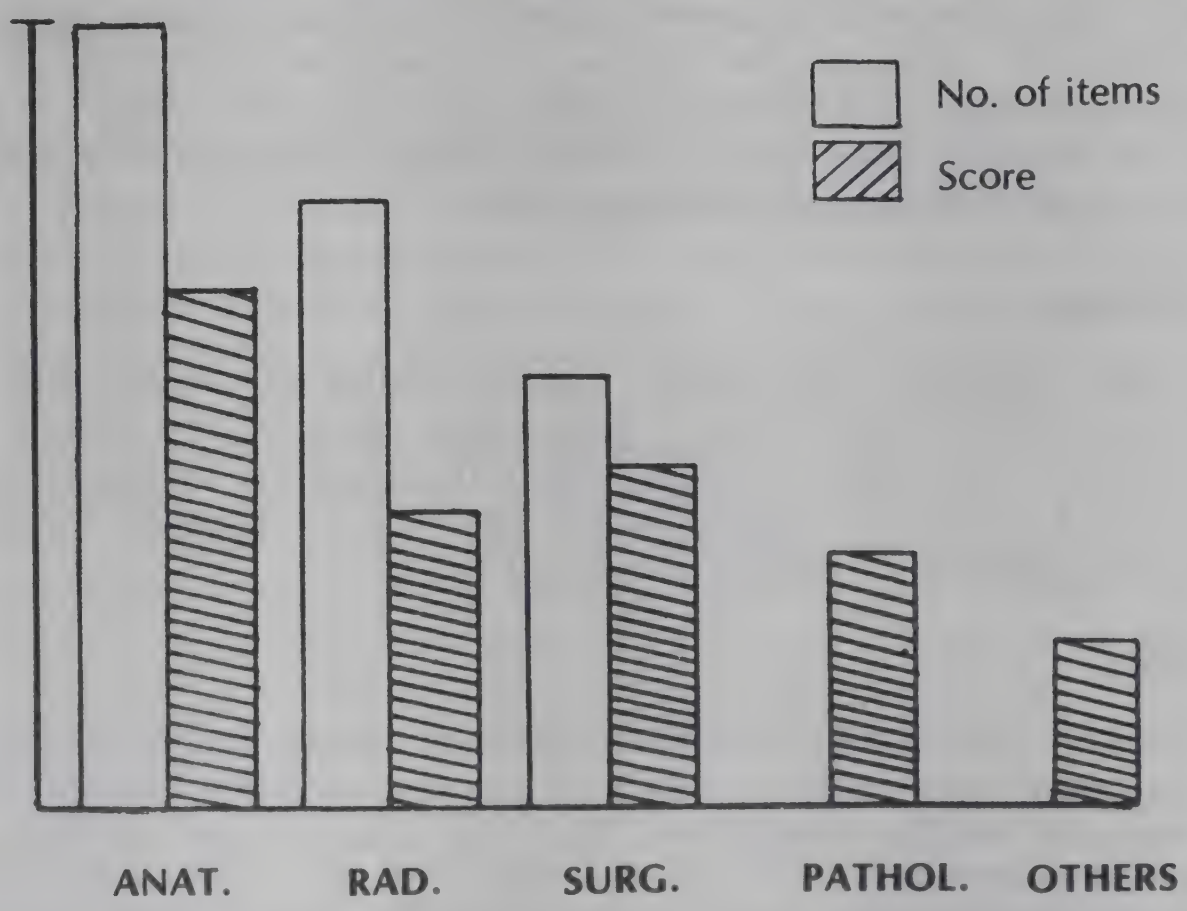

FIG. (1): SPECIALTY-ITEM SCORE RELATIONSHIP

The response to the different components of anatomical sciences was variable (Fig. 2). Items of gross Anatomy were best valued by Anatomists, Radiologists and Surgeons, in that order. Embryology was seen important by Anatomists, Surgeons and Radiologists, Histology by Anatomists and Pathologists and dissection by Anatomists and Surgeons.

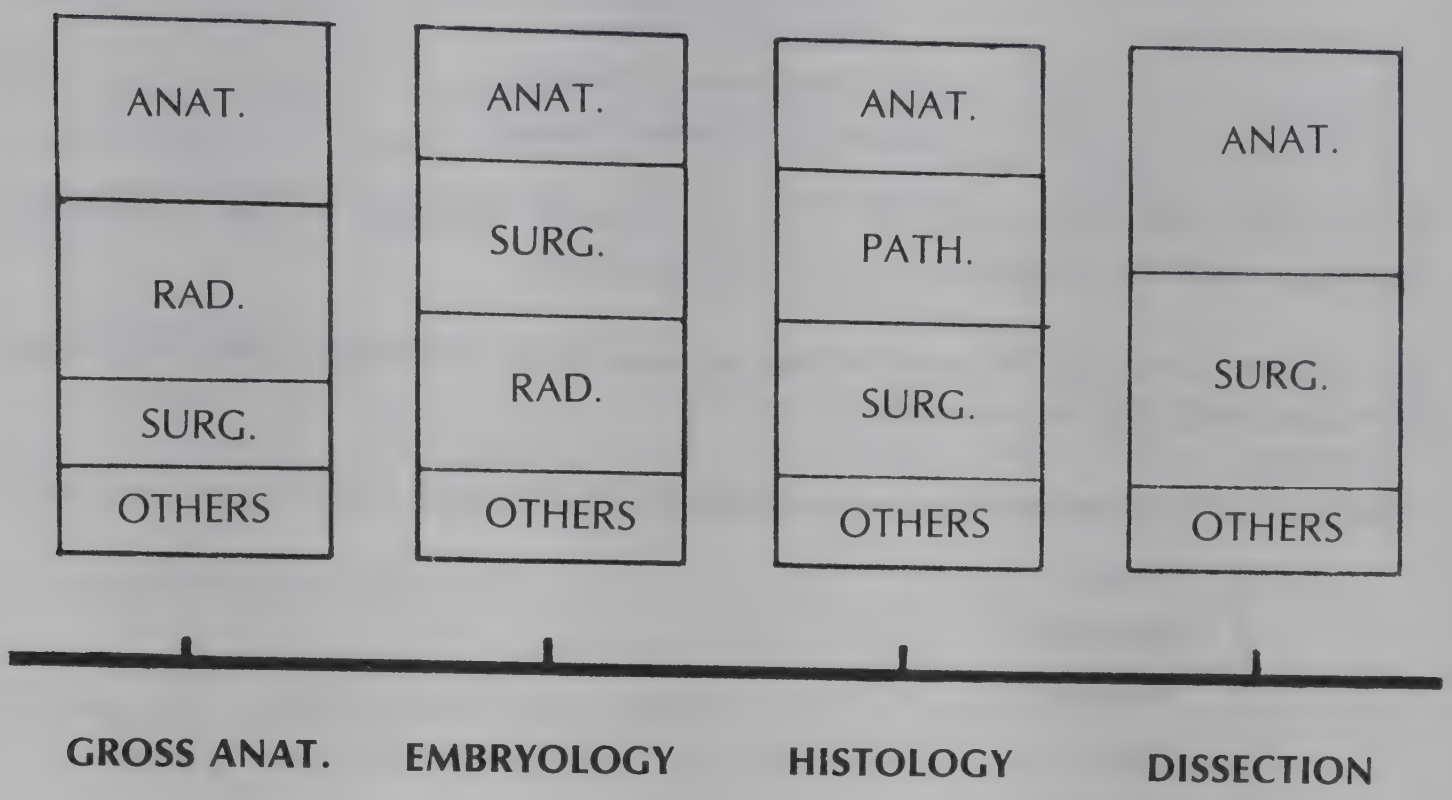

FIG. (2): ANATOMICAL SCIENCES SPECIALTY SCORE

Conclusions

The importance or relevance of a specific cognitive item which is to be included or excluded from the curriculum, requires a reliable method of selection of items. Item-score in the areas of "importance" and "relevance to health problems" is hereby suggested. Inspite of the expected disagreements between specialty groups, there are items which can be positively scored in the view of many specialists. Such items can be included in curriculum design as specific objectives. Existing objectives congruent with 'high-score' items are to be retained. This consensus method is more appropriate to extensive subjects like Anatomy.

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1. Crombie, AL. *Ophthalmology in undergraduate curriculum.* Ophthal Soc WK, 1976; *96*: 33 - 34.

2. Spivey BE. *Ophthalmology for medical students: content and comment.* Arch Ophthal, 1970; *84:* 368 - 375.

3. Spivey BE. *A technique to determine curriculum content.* J. Med. Educ., 1971; *46*: 269 - 274.

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5. Worthen DM. *Ophthalmology for medical students: objectives.* Arch. Ophthal., 1972; *88*: 314 - 315.

6. Ali, GM. *Anatomy Content Questionnaire,* Gezira Faculty of Medicine, Sudan, 1982.

CHOOSING AN EVALUATION METHOD

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In the past 20 years there has been a dramatic increase in the evaluation methods available to faculty in medical education.

In choosing amongst the ever increasing evaluation technique certain general principals must be kept in mind.

These principals are that the examination method must be:

1. Valid
2. Reliable
3. Relevant
4. Objective
5. Practical

It is evident from the foregoing that the objectives of the course being evaluated must have been clearly stated since, if you are unsure of what you want to test you cannot choose a valid examination technique. It is also evident that most aspects of clinical medicine involve knowledge, psychomotor skills, problem solving skills and attitudinal and communicative skills, and therefore it is very seldom that one test method can adequately assess all of these aspects for a given course either at the undergraduate or postgraduate level.

The methods used in evaluating clinical competence may be grouped under the following headings:

1. Written
2. Oral
3. Clinical
4. Simulations
5. Actual Performance
6. Mixed

WRITTEN EXAMINATION

1. Essay

Essay-type examinations are being used much less frequently nowadays as a tool in the assessment of clinical competence. The main problem is that only a limited area of the course content can be tested.

However, they do test the student's knowledge base, his ability to organize ideas, synthesize a plan, and express it in lucid English.

Essay examinations are easy to set, but are time-consuming to mark. Since they cannot test data gathering or motor skills, they do not carry a high validity and marking is notoriously unreliable and subjective.

Short answer question examinations have the candidate write 2 to 3 sentences or paragraphs on a variety of topics. They allow a broader range of contents to be covered and tend to be more reliable but still not a valid test of clinical skills.

2. Completion

In this type of question, the stem of a sentence is given. The candidate is asked to complete the sentence with the correct answer. The comments regarding short answer questions apply to this type of examination.

3. Multiple Choice Questions

This type of examination is only too well known to all faculty members and students. It is probably the most common type of examination used in both undergraduate and postgraduate medical education.

The advantages of this type of examination are obvious. They include increased objectivity and reliability. This type of examination is practical. With careful preparation relevance can be excellent, but the relevance of many questions that I have seen in MCQ examinations is questionable. This type of examination increases the range and variety of facts which can be sampled in a given time, and provides the opportunity (seldom availed) to provide detailed feedback to both students, and examiners.

Recently, it has become increasingly apparent that MCQ examinations have major drawbacks. This is particularly true in medical education. Due to the inevitable cueing, MCQ's measure mainly passive recall. Most questions, unless carefully constructed, measure knowledge of isolated facts. Additionally, the construction of 'good' questions requires a lot of time and effort. The validity of this type of examination as a measure of clinical competence should be seriously questioned.

Although the term Multiple Choice Examinations should refer only to those in which the candidates are given several possible choices for the one correct answer, the term is loosely applied to several types of more simple (i.e. choice or true-false) or complicated (e.g. "K" type) types of questions.

4. Patient Management Problems

These will be further discussed under simulations.

ORAL EXAMINATIONS

For many centuries, this has been the standard method of examining clinical competence. This type of examination if properly conducted, has a number of

advantages. It provides direct personal contact with the candidate, and usually requires the candidate to supply his own formulation of the problem and its solution. It provides the opportunity to question the candidate regarding how he arrived at a particular solution. More than one examiner can be involved in the same examination.

One of the advantages of the oral examination, i.e. that it provides the flexibility to move from a candidate's strong areas to his weak areas is also one of its inherent weaknesses in that it usually does not provide any standardization of questioning from candidate to candidate.

Some increased objectivity can be provided by having each candidate discuss standardized hypothetical cases for which the examiner has been provided with the outline of an acceptable problem solving approach. Oral examinations, are very time-consuming and notoriously unreproducible between examiners and even when the same examiner is asked to rescore a video tape.

Sir Jonathan Hutchinson succinctly summarized one of the major disadvantages of the oral examination when he said: "If a student were of a gentlemanly bearing, if he had studied at a proper school and did not display gross ignorance, he was in no sort of danger. The examiner might ask his name and place of birth, and having learned that, possibly send a kind message to his father or uncle."

CLINICAL EXAMINATIONS

Usually combined with an oral examination, the clinical examination requires the candidate to see a patient (or a simulated patient) and to examine him or her. Since the practice of clinical medicine involves this activity more than anything else, the validity is high in this type of examination. However, because of the problem of patient variability and accessibility, the reliability and relevance of this type of examination has been called into question.

In an attempt to overcome this problem, the use of simulated patients has become common practice in some centres. This ensures that each student can be examined on the same problem. Early studies would suggest that this increases the reliability without interfering with the validity.

Most clinical examinations measure product, i.e. the ability of the candidate to obtain information from the history and the physical examination, rather than process, i.e. his method of obtaining the information. Since the product, or information gained, relates to the candidate's competence in gaining such information, it is important that he or she be observed while gathering data in order to measure the correctness of the data-gathering technique.

Thus, some clinical examinations now involve the examiners actually observing the history being taken and the physical examination being carried out. The observation possibly increases the ability to measure attitude. It also is often not very practical, because of constraints.

SIMULATIONS

Because increasing the validity of any examination of clinical competence (e.g. by increasing direct patient contact) generally causes a decrease in the reliability, examiners have been led to the development of the use of simulations. These generally improve reliability and increase objectivity.

1. Written or Printed Simulations:

Patient management problems, originated by Rimoldi and further adapted and developed by McGuire, have become a standard part of various national and international examinations. The typical Patient Management Problem begins with a variable amount of patient data that identify the setting. The student is then requested to collect further data in sequential fashion, either in linear or branching way. The student is asked to make appropriate diagnostic and management decisions. A variety of technical devices are used to obscure the answers.

The student's pathway through the problem is then marked and scored for such things as thoroughness, efficiency and proficiency.

The Patient Management Problem is relatively valid for content and appears to be reliable and objective. However, it is difficult to get away from the effect of cueing and the format tends to be inflexible. In addition, since the clinical information is supplied, it does not measure the candidate's ability to obtain that information for himself.

Variations on this technique have been used in an attempt to overcome these advantages. These include: Sequential Management Problems (SMP), and the Modified Essay Question (MEP) type of examination. The usefulness of these modifications has yet to be determined.

PMP's which involve the selection of appropriate cards containing information and choices, with branching of the steps to be taken, have been developed by Barrows and his colleagues. Again the validity and reliability of this technique of evaluation has yet to be determined.

2. Computer Simulations:

The development of a number of excellent computer simulations on main-frame computers during the late 1960's and early 1970's led to a great amount of excitement amongst medical educators. It seemed an ideal way of evaluating objectively certain aspects of the clinical performance. However, because of a number of disadvantages, this approach to evaluation (and to education) early gained a bad reputation.

Computerized simulations are extremely time consuming to develop. They do allow the examiner to cover a wide spectrum of material and to measure problem solving as well as factual recall. One major drawback was the expense of providing access to the main frame terminal for large numbers of students.

The development of increasingly inexpensive personal computers has already led to a resurgence of the use of computers in education and evaluation. Their

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diminishing price will make the use of computer simulation increasingly practical and they will probably be used more and more for evaluation of some aspects of clinical competence.

3. Photographs, Videotapes and Audiotapes:

The difficulty in obtaining adequate and relevant clinical material which can also be reproducibly provided to all students, has led to the increased use, particularly in the United States, of clinical photographs, video and audiotapes of patient material.

Whilst no doubt increasing the reliability and objectivity of any examination in which such techniques are used, there is probably a loss of validity in that the student is presented with predetermined clinical material and is not asked to demonstrate or elicit the findings himself.

4. Simulated Patients:

A further attempt to overcome the difficulty of providing each student with the same clinical material to examine, has been the use of simulated patients. This technique has been used increasingly in some centres and has been extremely useful, both for teaching and for examining competence in motor skills, e.g. vaginal and rectal examination. While some studies suggest that carefully trained patient simulators are just as good as true patients, there are obvious limitations to what can be simulated and how well.

5. Simulation Devices:

Another attempt to overcome the reproducibility of clinical material particularly in relation to the evaluation of motor skills has been the development of factitious anatomical models. While some of these have obvious usefulness in demonstrating and practicing technique, the variability in quality of such models and the validity of using nonhuman material to represent the human (how realistic can one get about catheterizing a disembodied wire and rubber penis?) leave some doubt as to the validity of such methods in evaluation.

MEASUREMENTS OF ACTUAL PERFORMANCE

1. Supervisor Evaluation:

This has been one of the classical methods of evaluating clinical performance. It has the obvious disadvantage of subjectivity. The 'halo' effect of assigning a high mark to someone you like is well known.

Additionally, this method of evaluation frequently takes into account only the outcome rather than how the outcome was achieved. Evaluation of clinical performance by a number of disparate supervisors brought together in a summative evaluation probably improves reliability. However, this is difficult to measure.

There is no question but that this technique of evaluation is practical and reasonably valid in that it measures actual performance rather than what the

candidate says or writes that he would do. But supervisor evaluations frequently over-estimate the amount of knowledge that the student possesses and put more emphasis on his perceived problem solving skills.

2. Record Audit:

This has become an increasing favorite of hospital and government administrators as a method of evaluating ongoing clinical competence.

Audit of medical records allows one to use material which is apparently objective, i.e., written records, which can theoretically be assessed in an objective manner. This is particularly so if criteria have been preset regarding the optimum management in a given clinical situation. Unfortunately,

a) the logic of the standard medical record is often very difficult to follow. It should be noted that the use of problem oriented medical records does make the flow of diagnosis and management easier to follow;

b) what is written as done is not always what was actually done;

c) obsessive-compulsive record keeping does not necessarily indicate compassionate rational medical care.

3. Outcome Measurement:

The measurement of outcome is a newer, very time consuming and labor intensive, method of evaluating clinical competence. It is only used in some experimental situations. With this technique, unknown to the person being evaluated, their real-life management of a well defined clinical problem is followed throughout the whole course. The outcome in relation to diagnosis and management is measured and compared to the ideal outcome.

Although probably valid and possibly reliable, this approach will never be practical for the evaluation of large numbers of undergraduate or postgraduate students.

MIXED METHODS OF EVALUATION

1. Oral and Clinical Examination:

This has been commented on previously.

2. Objective Structured Clinical Examinations (OSCE):

This type of examination was developed at the University of Dundee, in the 1970's, in an attempt to combine in one examination several methods of evaluation. It attempts to capitalize on the best facets of each method. The examination uses real patient material, simulated patient material, models, multiple choice questions, video-tapes, photographs, and short answer questions and MCQ's. The students rotate through a series of stations containing either clinical material or questions to be answered. At certain stations they are observed either taking a history or carrying out a clinical skill, and they are marked on their technique. Since the correct method of history taking, the examination of a particular clinical area, and the correct answer to

the written question have been predetermined, the examination has been shown to be relatively objective.

THE OSCE AS AN EXAMINATION FORMAT

The Objective Structured Clinical Examination should not be seen as an examination method, it is in fact an examination format or a framework on which a variety of examination methods can be used.

Thus providing the ground rules are followed:

- Multiple Stations
- Time Limit
- Standardized Checklist
- Objective Questions

The OSCE can incorporate tasks of:

- Varying Length
- Basic Clinical Skills
- Procedural Skills
- Problem Solving Skills
- Attitudes
- Counselling Skills, etc.

— and can use written, oral, clinical and simulations as examination methods.

CONCLUSIONS

The armamentarium available to those involved in the evaluation of clinical competence is growing. No single test method can usually measure the spectrum of the objectives of a given course in medicine.

In choosing evaluation methods the course objectives should be reviewed and methods of evaluation appropriate to measure the objectives should be chosen.

ATTITUDE OF THIRD YEAR MEDICAL STUDENTS TOWARDS THE OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

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The Objective Structured Clinical Examination (OSCE) is a format of clinical assessment where students rotate round a circuit of stations, spending 5 minutes at each station, carrying out procedures and answering questions as instructed, after which a bell will ring and students will proceed to the next station. This process is repeated until all students have covered all stations. The medical school in Universiti Sains Malaysia have been using the OSCE format of assessment since 1981 for formative and summative assessments. Through experience, trials and errors, and feedback from staff and students, improvements have been made through the years to ensure the smooth running of the OSCE and in this way, to ensure fairness to staff and students.

To find out how the students and their acceptance of the OSCE format of assessment, 2 sets of questionnaires based on the Likert Scale and the Osgood Semantic Differential were distributed. Statements in the Likert Scale include those concerning the clarity of both instructions and questions, time given per station, use of checklists by attending examiners, the use of simulated patients, briefings before the examination and so on. Responses to each statement are made by ticking in the appropriate boxes provided in the questionnaire using a 5 point response continuum ranging from Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Marks or points are awarded for each responses, depending on the statement. All points are added up and each respondent will have a total score for the Likert Scale. Similarly, the Osgood Semantic Differential Scale was distributed to the students. In this questionnaire, positive and negative bipolars adjectives were used to describe the OSCE. And in between these bipolars are 7 blank dashes; responses are made by ticking on any of the 7 dashes. The closer the tick to that end of the bipolar scale, the more strongly the respondent feels that that end of the scale best describes the OSCE. Points are awarded for each response made and a student has a total score for the Osgood Scale.

Both questionnaires were distributed to 99 third year students after sitting for their second professional OSCE examination. Out of 99, only 60 students or 59.4% completed the questionnaire. The remainder 39 students or 40.6% did not or partially respond to the questionnaire.

With a mid-point score of 70 for the Likert Scale, 55 out of 60 students (54.45%) out of 59.4% had a positive attitude score towards the OSCE and only 5 (4.95%) had a negative score.

With a mid-point score of 38.5 for the Osgood Scale, 57 out of 60 students (56.43%) out of 59.4% gave a positive attitude score and 3 students (2.97%) gave a negative attitude score towards the OSCE.

When both attitude scales are plotted against each other, only 1 student (0.99%) had a negative for both Likert and Osgood Scales. With an in-built counter-check system in the questionnaires, 52 out of 60 students (51.48% out of 59.4%) were consistent in their responses towards the questionnaires.

Despite the fact that only 60 out of 99 students responded fully to the questionnaire, nearly all students, except one, had a positive attitude towards the OSCE as a format of assessment.

In conclusion, OSCE is a favourable and well accepted format of assessment among the third year medical students at the School of Medical Sciences, Universiti Sains Malaysia.

PERFORMANCE OF MEDICAL STUDENTS IN THE FIRST, SECOND AND THIRD PROFESSIONAL EXAMINATIONS BASED ON CROSS-SECTIONAL AND COHORT STUDIES

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The Faculty of Medicine, University of Malaya, has been in existence for 22 years. It will soon celebrate its Silver Jubilee, and from its inception in the year 1963, it has contributed to the development of the health manpower of the country. Its graduates have occupied and exercised influence in almost every area of health in Malaysia. It has assisted in providing the academic staff for the University of Science and the National University. However, its long-established unchanging system, will, in a way, engender it to stagnation, and perhaps decline in standard, unless serious attempts are made to evaluate its educational system and policy.

A milestone of a sort was accepted by Faculty when GMC recommended that it should look into its curriculum. A Task Force on curriculum development was established with the Dean of Medicine as its Chairman. A preliminary report has been tabled at Faculty and it can be said that the Committee has taken to its task with enthusiasm and dedication. Arising from the work of this Committee, there is no doubt that Faculty will undergo changes.

Evaluation

It became clear, however, that the Curriculum Committee is working under a vacuum, unless some information is available on the performance of its students and graduates during the last two decades. Based on the expected current changes in its curriculum and concern expressed by members, it was decided to conduct an analysis on the performance of its graduates during the last 20 years. Academically, it also makes sense to understand, whatever changes instituted should in no way be inferior to past system. It was, therefore, imperative that some kind of baseline information and data be obtained from the performance of its students. This task was undertaken by the Dean's Office. The objectives of the evaluation will be to:

1) analyse the detailed performance of each subject from the First to the Third Professional Examination,
2) identify whether there had been a decline in the quality of its graduates,
3) recommend to Faculty appropriate changes in its examination system,
4) provide basic information of students performance to the Curriculum Development Committee.

Curriculum

The medical undergraduate education programme stretches for five years. In the first two years, the emphasis is on basic medical sciences to prepare the student for the oncoming clinical years. The first year comprises of Anatomy (350 hours), Biochemistry (177 hours), and Physiology (169 hours). Interspersed within the first year is Statistics (35 hours), languages such as English and Bahasa Malaysia (145 hours) and special tutorial classes (bimbingan khas) for the weak Bumiputra students (55 hours). There has not been any major change in the first year curriculum over time. Although Anatomy has vacillated between dissections and prosections, the main thrust of the programme has remained on dissections. Besides Gross Anatomy, it also has Embryology and Histology. Statistics initially took up 70 hours of contact time. This has been reduced in Year I from 70 hours to 35 hours.

During the first year, University policy has dictated that the students should be proficient in both Bahasa Malaysia and English. It has taken considerable part of the students' time to meet this demand in the first decade. It was approximately computed that 145 hours were used in the teaching of Bahasa Malaysia and English. It is also mandatory for the students to pass examinations in **both** languages.

In the second paraclinical year, Medical Microbiology, Pathology, Parasitology and Pharmacology complete the basic medical science curriculum. Social and Preventive Medicine also provides courses in Epidemiology and Inferential Statistics.

During this period, the clinical application of each subject is emphasised through correlation classes in the form of lectures, patient demonstration with active participation from lecturers in the clinical disciplines, in an effort to impress upon the students the rationale for learning the basic sciences and to demonstrate the links between the clinical and basic science.

The third year is regarded as a transition period where further integration between the basic medical sciences and clinical practice is emphasised and taught. This is made possible by the continuing involvement of the pre- and paraclinical teachers in the clinical programme. The educational objectives of both the third and fourth years are to provide sufficient knowledge and clinical skills in the detection as well as the investigation of diseases. The role of the environment, socioeconomic factors and sociocultural habits in the causation and prevention of the diseases are integral parts of the programme at this stage. Year 3 consists of 41 weeks where the students start off with an Introductory Course to Clinical Medicine followed by further lectures in Social and Preventive Medicine and a Junior Clerkship programme. However, there is no formal examination at the end of the third year.

In Year 4, the rotation continues with SPM (4 weeks), Senior Clerkships and Special Clinics. At the end of the fourth year, the students have to sit for an examination to test the skills which they have acquired in the third and fourth years.

The study only includes those students in their first attempt during their respective years. This enables the identification of the actual failure rate for each examination and the correct distribution of the scoring system. Students who did the supplementary and passed were not included because the marking system differs from the first timers by the fact that they were merely graded either pass or fail.

Examinations

The First Professional Examination is conducted at the end of the first year in Anatomy, Physiology, and Biochemistry. Viva Voce Examination are also included for borderline students. Those who fail in one or more subjects at the main examination are allowed to resit in a supplementary examination. Failures are allowed to repeat once during the first year.

The Second Professional Examination during the second year includes such subjects as Medical Microbiology, Parasitology, Pathology and Pharmacology. Borderline students are reassessed by vice-voce examinations.

The methods of examination since 1964 have neither really changed in substance or in content. They are based on written papers, viva voce and practicals in the First and Second Professional Examinations. In the Third Professional Examination, clinical assessment is based on patient interview and discussion. Borderline candidates are normally given vicas or clinical re-examinations before finalisation of marks.

Overall Performance of Various Ethnic Groups between 1964 and 1985

From 1964 - 1985, there were altogether 2,825 students who entered the Faculty. Of these, 1,850 have graduated, 53 have had to leave the Faculty, through various social circumstances, while 121 have left through failure. The overall failure rate is particularly high, in the first year where 83 students (68.6%) contributed to the total number; while in the second year 31 (25.6%) and the fourth year 7 (5.7%) left their courses. The sample being studied consists of 1,872 students. Within this, 53.1% were Malays, 57.2% Chinese, 7.5% Indians, and 2.2% Others.

First Professional Examination

Mean Scores

The First Professional Examination covers three subjects — Biochemistry, Physiology and Anatomy. Of these, Anatomy has the greatest student/teacher contact hours of 350, while Biochemistry and Physiology contributes 177 and 169 hours respectively. The distribution of the mean scores of the three subjects shows a remarkable consistency inspite of the diversity of subject material. All three cluster within the mode of 55, and median of 52.8 to 53.5. The means of the three subjects are 55.48 — Biochemistry, 46.74 — Anatomy and 57.3 — Physiology. The standard deviation among the three subjects is also consistent, reflecting the non-diversity of the student population, and the consistent marking system.

Variations in Student Performance Over Time

On looking at the performance of each individual subject over time, one can observe that the mean varies between 52 to 62 for Physiology, 50 to 61.18 for Anatomy, and 48.36 to 60.44 for Biochemistry. There has not been any appreciable decline in the mean scores over time although there were two exceptional years, 1974 to 1975, for Physiology, where the overall mean of the students rose to 61.68 and 62.03, and 60.44 for Biochemistry in 1973, and 61.18 for Anatomy in 1978. What is further interesting in the data is the apparent widening of the standard deviation over time. For Physiology, the standard deviation has always remained below 9 from 1966 to 1976. From 1977, the standard deviation increases from 10.26 to 13.25. This pattern is repeated for Anatomy and Biochemistry with the exception that the variations were observed in 1978 for Anatomy, and 1977 in Biochemistry. One may infer from these observations that there has been a noticeable wider dispersion in student performance from 1977 for Biochemistry, 1978 for Anatomy, and 1977 for Physiology. It would seem that 1977/78 was the turning point where the students of varied calibre were accepted into the Faculty. This trend seems to have been maintained throughout the years till 1981 when Faculty commenced to accept entry points from Pusat Asasi Sains students. It should be noted, however, that the variation in student performance occurred even before the acceptance of students from Pusat Asasi Sains.

Bimodalism

The scores, frequency distribution, and percentage of the three subjects were analysed from which the percentage scores table were computed (Figure 1). This graph clearly shows the two groupings of students in Year I. It shows a bimodel distribution where the average student scores between 50 to 70, while those who had failed were grouped around 30 to 50. This bimodel pattern clearly shows that there are two groups of students, the weak and average. Some remedial teaching method is clearly required for the weak students. The problem, however, is how to identify them.

Second Professional Examination

The samples of students analysed in year II covered the years 1967 to 1982. The four subjects were Microbiology, Parasitology, Pathology and Pharmacology.

Mean Scores

The mean scores for all the four subjects were extraordinarily higher when compared to first year subjects. Most of the mean scores were over 55 consistent over time.

In Microbiology, less than 10% of students scored below 47. However, exceptionally higher failure rates were encountered in 1977, 1978, 1979 and 1980, where as high as 40.5% of students in 1980 scored 47 and below. Trends of these four years were not sustained in 1981, 1982, where the failure rates dropped to 7%.

Parasitology also exhibited the same distribution as Microbiology where the overall performance of the students were maintained over time till 1982. The student population scoring less than 47 is usually less than 10%. It does seem that the students find Parasitology much easier than Microbiology.

In Pathology, consistent with the other two subjects, less than 10% scored 47 and below, with exceptionally poor years in 1977 and 1982, where 32% and 15% failed respectively. There was no observable definitive pattern in the failure rates.

The mean scores for Pharmacology over time varies between 54.71 to 60.96. The overall performance of students seems to be satisfied where the below-47 scorers vary as low as 6.4% (1968) to 18.4% (1977). There does not appear to be any definitive pattern on the failure rates. The overall variance is consistent with the random distribution of the sample.

Analysing subject by subject, it is observed that Microbiology 8.2%, Parasitology 5%, Pathology 6.8% and Pharmacology 10.4% of the students scored 47 and less.

Disappearance of Bimodalism

The bimodal distribution of student population in Year I seems to have disappeared by the time they completed Year II. Figures 2 to 5 show the frequency distribution of percentage scores of Microbiology, Parasitology, Pathology and Pharmacology. The graphs were more bell-shaped in appearance with a peak between 50 — 60 scoring point and with a flattish distribution for those scoring less than 50%. This points to an important educational principle. The weaker students, once they have successfully negotiated Year I, appear to successfully merge with the rest of the successful students and subsequently can no longer be identified within the student population. One can speculate as the reason:

1) that the students have developed maturity and examination savvy, and hence are able to adapt better to a second year course;

2) that they have improved their studying techniques;

3) the second year subjects may be more clinically oriented and may not be as difficult as the first year students;

4) the methods of teaching and evaluation may be more effective than Year I;

5) the students may show more interest in Year II since it has greater bearing on the subject of Medicine.

Third Professional Examination

In the Third Professional Examination, the students were evaluated in the following subjects:

1)	Paper I	— Essay (Multidiscipline)	3 hours
2)	Paper II	— Essay (SPM)	3 hours
3)	Paper III	— MCQ	2 hours

4) Paper IV — MCQ 2 hours

5) Practical (Multidiscipline) 3 hours

6) Clinical Examination (one long case)

Paper 1 — Essay

This Essay Paper is comprehensive in nature, containing questions from the following disciplines: Medicine, Obstetrics & Gynaecology, Orthopaedic Surgery, Paediatrics, Psychological Medicine and Surgery.

Paper II — Essay (Social & Preventive Medicine)

This paper examines the student in the subject of Social and Preventive Medicine and it involves all the course material that the student has learnt in the first four years.

Paper III and Paper IV (MCQ)

Papers III and IV consist of 60 MCQs each. Questions are based on the following disciplines: Medicine, Surgery, Orthopaedic Surgery, Obstetrics and Gynaecology, Paediatrics, Psychological Medicine, Anaesthesiology, Otorhinolaryngology and Opthalmology.

Practical

This is a composite paper which examines the student in the following disciplines: Pathology, Social and Preventive Medicine, Medicine and Otorhinolaryngology.

Clinical Examination

The Clinical Examination consists of an assessment of the students' competency in history-taking and elicitation of physical signs. It is an integrated examination where the students are given a long case, expected to take a detailed history and discuss the relevant physical features of the case. The focus of the examination is on how the students conduct themselves in front of the patient, and their ability to carry out a comprehensive and detailed physical examination. They may be asked on the management of the case, especially in Obstetrics: however, the emphasis is more on the elicitation of physical signs.

The scores of the above six examination papers are added and the final integrated assessment of the student is based on his total overall score and on his clerkship in each posting throughout the last two years. Generally, the candidates performed better in Year IV.

Paper I — Essay (Multidisciplines)

The mean scores for the essay paper varies between 50.98 to a maximum of 57.79. An interesting feature is the very narrow standard deviation compared to the other subjects. It varies less than 3 points, from 4.18 to 7.0 over time. The distribution of standard deviation remains around 5. This seems to indicate that there is a consistency in the assessment of the essay questions among the

examiners and an indication of a tight marking system being used. Taking 50% as the cut-off point, the failure rates appear to have wide variations from year to year, which can be as low as 2.7% in 1970 to as high as 32.0% in 1971.

Paper II — Essay (Social and Preventive Medicine)

The mean scores in the Social and Preventive Medicine Paper over time seems to be higher than the other subjects. It varies between 62 to 74. This may be explained by the fact that they are computed out of 120 instead of 100. Consistency of the marking system is reflected by the narrow standard deviation, i.e. 7.61 to 10.33. Taking the cut-off point below 60, the failure rates in Social and Preventive Medicine varies between 2.2% to 29.1% clustering around 15% over time. The failure rates, however, was exceptionally high in 1984 — 37.9%. There does not seem to be any definite trends. The fluctuations of the scores can be considered with random distribution of the results.

Practical (Multidisciplines)

The Practical Examination, on the other hand, had a varied mean score of 47.81 in 1982 to 62.87 in 1980. The overall performance is poorer than in Social and Preventiove Medicine. However, this may also be explained by the fact that the Practical is scored out of 80. In the years, 1969 to 1972, the practical was scored out of 50.

In 1972, only one student scored 63, while the rest scored 39 and below. There is a marked improvement in 1973 where only 4.2% of students failed. However, the best year was in 1975 where only 0.8% of students failed. The overall pattern for Practical has shown a marked improvement throughout the years.

Paper III (MCQ1) and Paper IV (MCQ2)

The worst performance noted are in MCQ1 and MCQ2 where as high as 42.4% (MCQ1) and 40.9 (MCQ2) scored less than 49%. There is a need for Faculty to consider carefully why MCQs have always been poorly performed by the students.

For MCQ1, between 1969 to 1984, taking 50% cut-off point, the eratic failure rates manifest themselves by the following scores:

1969	47.3%
1970	7.3%
1971	14.8%
1972	55.9%
1973	34.5%
1974	96.6%
1975	27.0%
1976	25.0%
1977	73.9%
1978	21.3%
1979	24.8%
1980	41.9%

1981	22.2%
1982	45.5%
1983	71.3%
1984	65.0%

The irregular variance over time should alert Faculty as to the need to review the whole system of setting up MCQs. It is unlikely that the inconsistencies can be attributed entirely to the quality of student population.

For MCQ2, the pattern is as irregular as MCQ1. When one analyses the 50% cut-off point over time, the following distributions were seen:

1969	24.7%
1970	6.4%
1971	13.9%
1972	26.3%
1973	59.7%
1974	75.4%
1975	28.7%
1976	38.7%
1977	58.0%
1978	6.6%
1979	28.8%
1980	39.0%
1981	54.5%
1982	48.8%
1983	71.3%
1984	67.9%

The patterns of bimodalism for MCQ (see Figure 6) again reflect the eratic pattern of the performance of the students. When one compares the total score for overall subjects, a clear bell-shaped distribution was observed to denote that the quality of students seems to follow the normal Gaussian distribution. It is only in the MCQs where this was broken. Even though MCQs have been used since 1969, there is an urgent need for Faculty to re-examine the whole philosophy of setting up MCQs. One suspects that the technique and method of designing the MCQs themselves may be at fault.

The variance on the scores for essays, clinical and practical examination are less extreme when compared to the MCQs.

An interesting feature is the wider dispersion of standard deviation in the clinical examination, compared to the others. This seems to indicate that there is some weakness in the performance of students in the clinical examinations, even though the means for the overall groups were satisfactory. At the other end of the scale is the standard deviation of essay paper which is the smallest among the six subjects. The marking system seems to be higher and there appears to be some reluctance on the part of the examiners to give extreme marks. The cluster is around the mean, with very few failures and distinctions.

Comparison of Performance between Pusat Asasi Sains and Pre-Medical

From 1979, the majority of Bumiputra students in the Faculty were received from Pusat Asasi Sains. It was important, therefore, to compare whether the performance of these candidates were in any way comparable with the Pre-Medical Bumiputra students. In general, with the exception of MCQ1 and MCQ2, there was no difference between these two groups of students. In MCQ1, the mean for Pusat Asasi Sains is 39.07 compared to 45.95, while MCQ2, the mean is 39.92 compared to 45.91. As for the others, there does not seem to be any trend or pattern. They vary with two points on either side of the other four subjects. One can conclude that the quality of Pusat Asasi Sains students is of equal calibre when compared to the Pre-Medical Bumiputra students. The overall failure rates of 19.2, Pre-Medical, and 19.9, Pusat Asasi Sains, were similar for the two groups. A more detailed analysis shows the standard deviation of the two groups for each subject. They do not indicate anv specific pattern and trend of performance.

Comparison of Non-Bumiputra students before and after 1979

The non-Bumiputra student intake began to decline after 1977. There seems to be a clear pattern emerging. The overall score for the post-1977 candidates appear to be slightly higher than the pre-1977. The performance of the post-1977 candidates in the first year and second year are superior in Anatomy, Physiology, Microbiology and Pathology. An interesting observation is the loss in edge of post-1977 students over time. Except for the clinical examination, in the Third Professional Examination, they seem to lose their advantages in other subjects. The improvement in performance is not surprising; as the number of non-Bumiputra candidates decline, the entry point becomes more competitive and hence only the best students are admitted into the Faculty. An interesting educational feature is that inspite of their being among the top non-Bumiputra HSC entrance qualifiers, they do not sustain their superiority in all subjects in the Third Professional Examination, when compared to the pre-1977 non-Bumiputra candidates.

Cohort Study Over Time of Poor Students in the First Professional Examination

Students who performed poorly in year 1 were identified. Two cohorts were established. Those who failed each subject in Anatomy, Biochemistry and Physiology and those who failed all three subjects. There were altogether 228 students in the first cohort and 85 in the second. The performance of the first cohort was traced in Year II and Year IV and a correlation matrix was constructed to evaluate their performance. There was surprisingly no correlation at all in the subsequent performance of these candidates in any of the subjects. A similar correlation matrix was designed for those who failed in all three subjects. Again, there was no significant correlation to the subjects in the Second and Third Professional Examinations, although there seems to be slight correlation in Biochemistry and Pharmacology (.32), Physiology and Essays (.32). This seems to reflect an important principle in terms of student maturity and development. The performance of poor students based on their performance in Year I is not indicative of their subsequent performance in the Second and Third Professional Examinations. A weeding process that has taken place in Year I may partly explain the lack of correlation but the number of

students who actually have to leave is usually small (2.9%). It does seem likely that the so-called poor students can with time develop skills and maturity which are comparable to others who did well in year I. Why this is so is still not clear.

DISCUSSION AND RECOMMENDATIONS

The analysis has highlighted several important issues for Faculty of Medicine to study and recommend appropriate action in line with accepted educational principles. These are:

1) Year I has very high failure rates, which have not been consistent in its pattern over time. There is wide variation from 7% to 49%. It is inconceivable that these results reflect the quality of the student population alone. There is a critical need, therefore, to evaluate the current methods of assessment, curriculum, and teaching methods in all the subjects.

2) The absence of bimodalism, from year II onwards, is an interesting educational phenomenon which cannot be ignored. Why this should be so is not clear. Suggestions have been made that they could be due to:

(a) maturity of the students;

(b) leaning of the subjects more towards the clinically-oriented in substance, hence making them interesting and relevant to the students;

(c) there could have been a change in the techniques of instruction, and increased motivation of the staff.

3) Multiple Choice Questions have always been a waxed issue faced by the Board of Examiners. The mean scores and the wild swing in pass rates from year to year reflect much inconsistency with good educational principles. The startling figures of failure rates that can vary anything from 7% to 96% are something for Faculty to ponder as to the reasons. There have been suggestions that the current MCQ format may not be suitable because they penalise the students too harshly. For example, to obtain a minus mark in one question, and have this carried over to the subsequent question does not seem to be fair from the educational and the student's point of view. Students who had done badly in a subject such as gout and then have this penalty carried over to another subject such as cardiac disease, seems contrary to educational principles. Experimental marking by the Department of Pharmacology where minus marks are contained within the specific questions seems appropriate and will need to be looked into by Faculty.

4) Finally, as to the question whether Faculty has maintained its standard will require some thoughtful interpretation of the data. The Faculty failure rates certainly has not increased over time, but the use of failure rates as an indicator does not seem satisfactory because of wild fluctuations in rates over time. One suspects that there may be other external factors in operation which are unclear at present. The method of assessing the variation of standard deviation over time certainly appears to indicate that there has been widening in the scores since 1977, but the pattern is not consistent. The general impression from the study indicates that the quality of students have not deteriorated when compared to their pre-1977 predecessors.

5) Comparisons of performance between Pusat Asasi Sains students and Pre-Medical Bumiputra students appear to be more conclusive based on failure rates and mean scores, there does not seem to be marked variance between these two groups. The only areas where the Pusat Asasi Sains students performed badly are in the MCQs.

6) An interesting feature of the study was the performance of non-Bumiputra students before and after 1977. There appears to be some indication that the non-Bumiputra students after 1977, tend to be of higher quality than those prior to 1977. This seems logical since the non-Bumiputra students entrance qualifications become more stringent as their quota gradually dimished from over 90% to 30%. However, their performance strangely enough does not seem to sustain over time. In Year I and Year II, post-1977 non-Bumiputra students were superior compared to their pre-1977 colleagues, but in year Year IV, the pattern is not obvious. If this effect can be further substantiated, then it is an intriguing educational phenomenon as to why performance of bright students seems to diminish over time. There are suggestions that many may have lost interest because of the poor teaching methods. Some are of the opinion that the presence of weak students may have a dampening effect on their motivation and development.

CONCLUSION

A long-standing institution like the Faculty of Medicine, which has been in existence for 22 years, stand in grave danger of being cemented by its policies and educational principles set at the beginning of time. Evaluation and self-criticism is the breath of fresh air required for its Professors and Faculty members to look at themselves, their students and to assess and praise those areas which need praising, and criticise those which are found to be wanting. The first step by Faculty has been undertaken by the setting up of the Curriculum Development Committee, even though this has been pressured by outside sources. This evaluation engendered within Faculty at least is a beginning of self-awareness on the need for change. The study is necessary for the curriculum Development Committee to carry on its work. More importantly for Faculty, is a reflection on a change in attitude to look at itself with seriousness and to examine those factors which need correcting, without having an outside body to pressure it to do so. Evaluation is one of the instruments of catharsis which Faculty should be using from time to time — to keep it on its toes, as it were.

FREQUENCY DISTRIBUTION OF PERCENTAGE SCORE
IN ANATOMY, BIOCHEMISTRY & PHYSIOLOGY
(1966–1985)

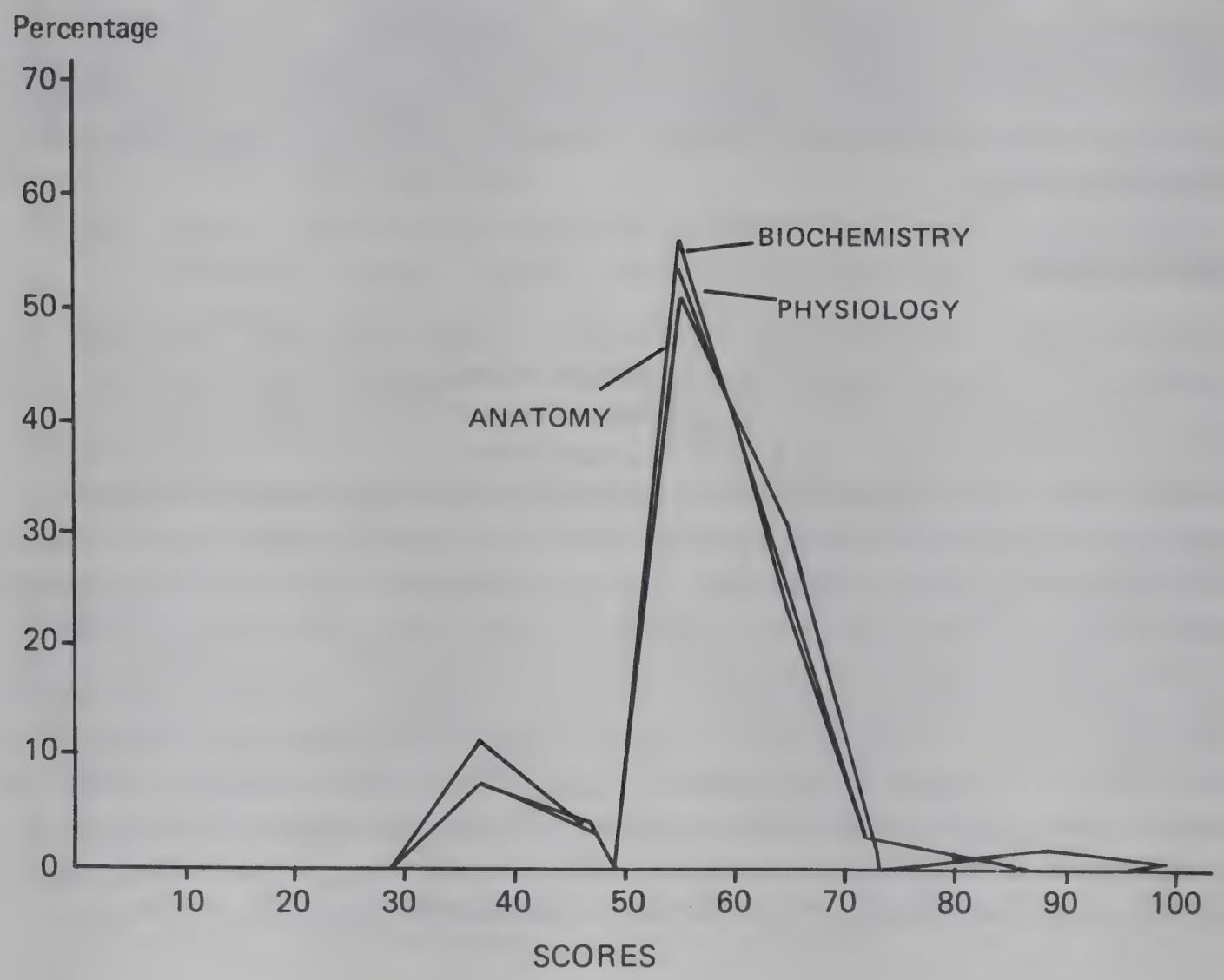

FIGURE 1

FREQUENCY DISTRIBUTION OF PERCENTAGE SCORE IN MEDICAL MICROBIOLOGY
(1966 – 1985)

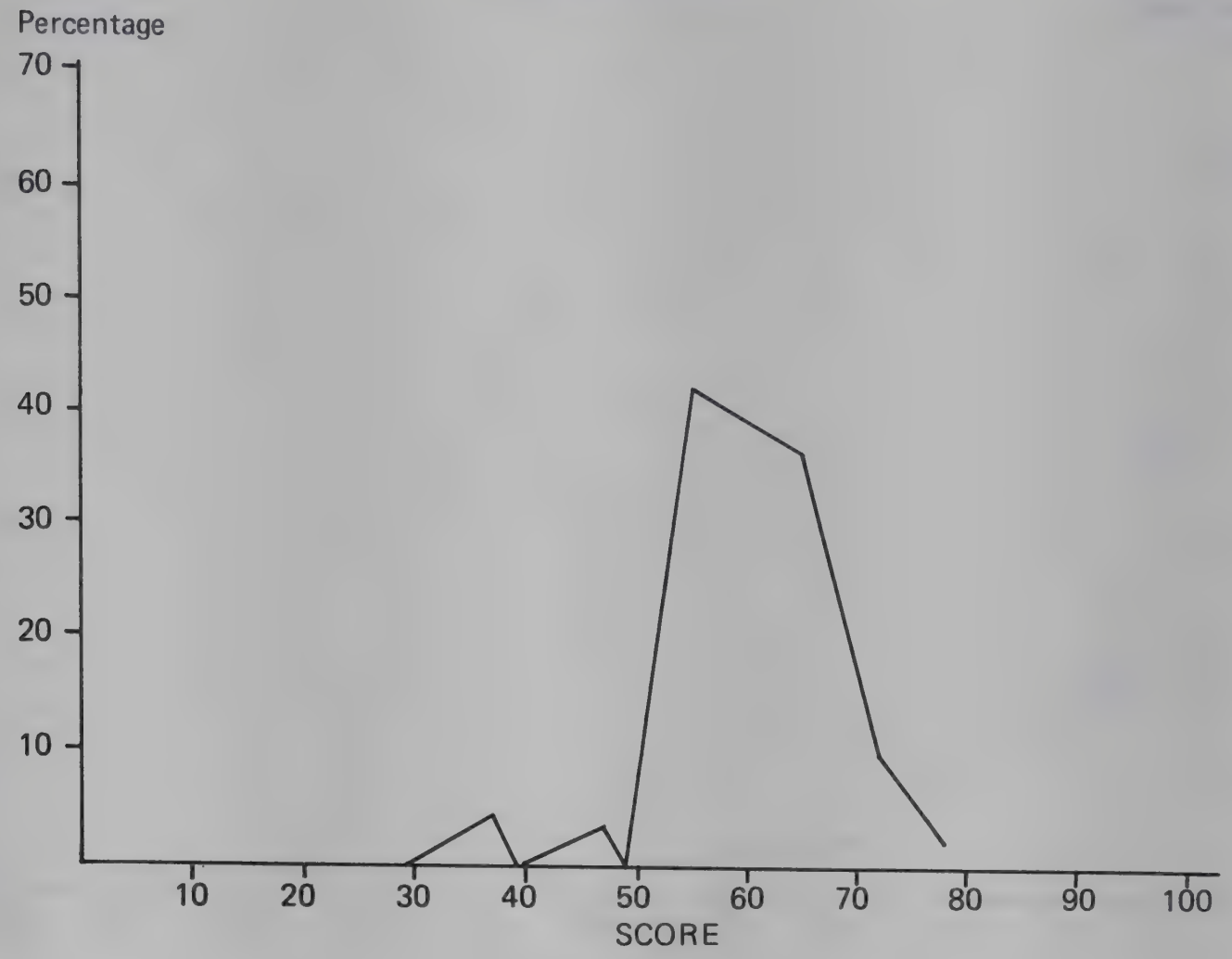

FIGURE 2

FREQUENCY DISTRIBUTION OF PERCENTAGE SCORE IN PARASITOLOGY
(1966 – 1985)

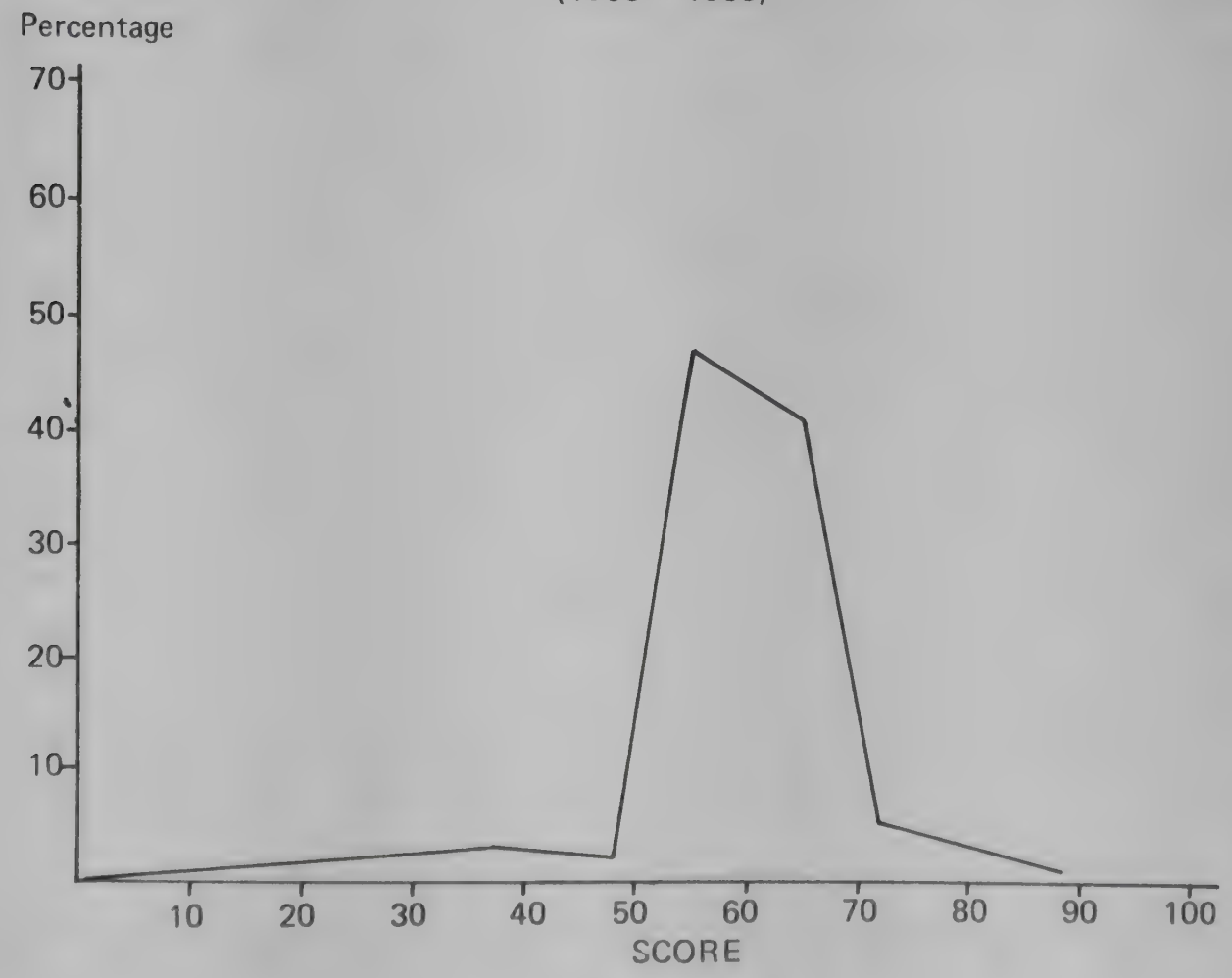

FIGURE 3

FREQUENCY DISTRIBUTION OF PERCENTAGE SCORE IN PATHOLOGY
(1966 – 1985)

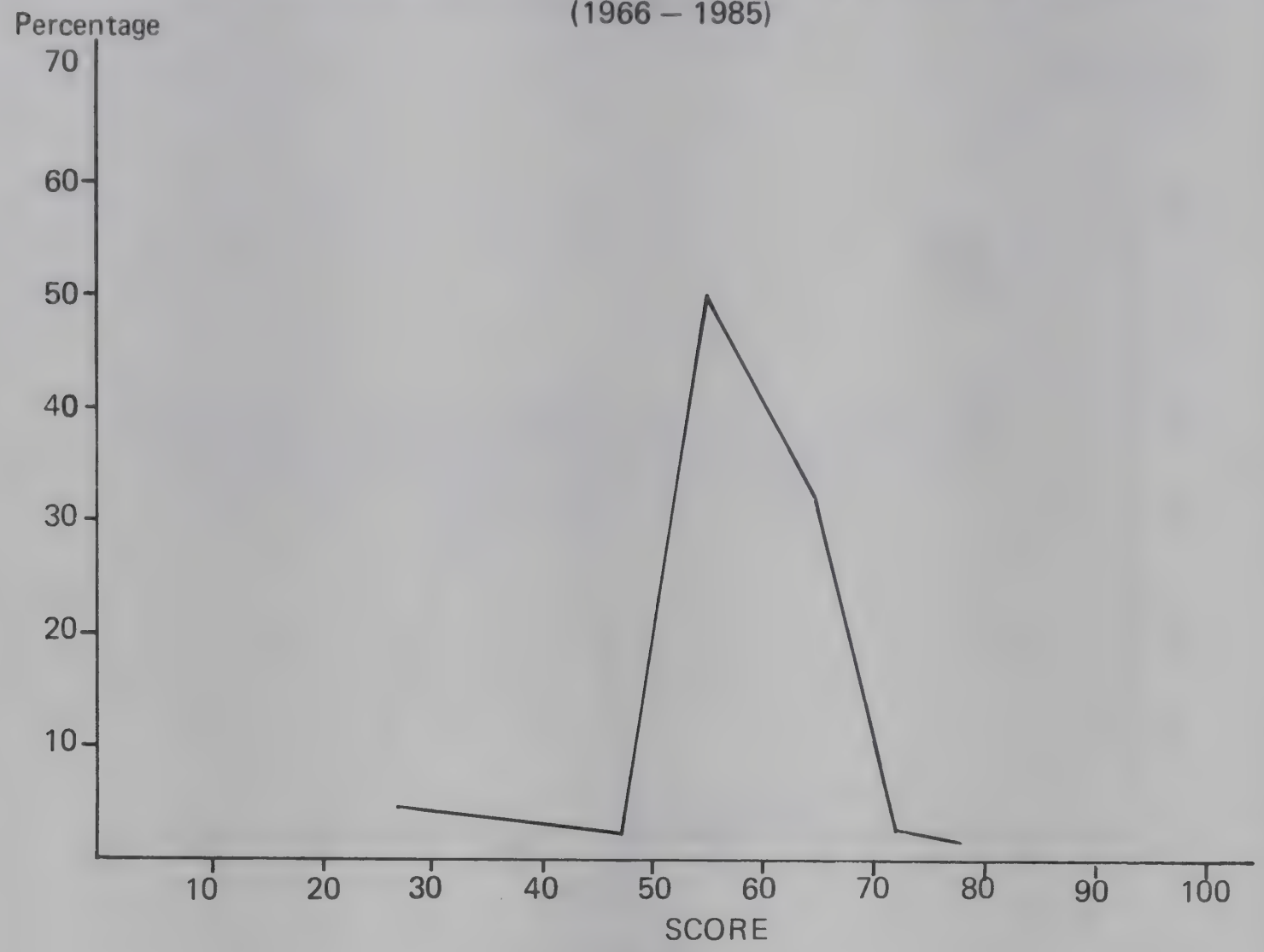

FIGURE 4

FREQUENCY DISTRIBUTION OF PERCENTAGE SCORE IN PHARMACOLOGY
(1966 – 1985)

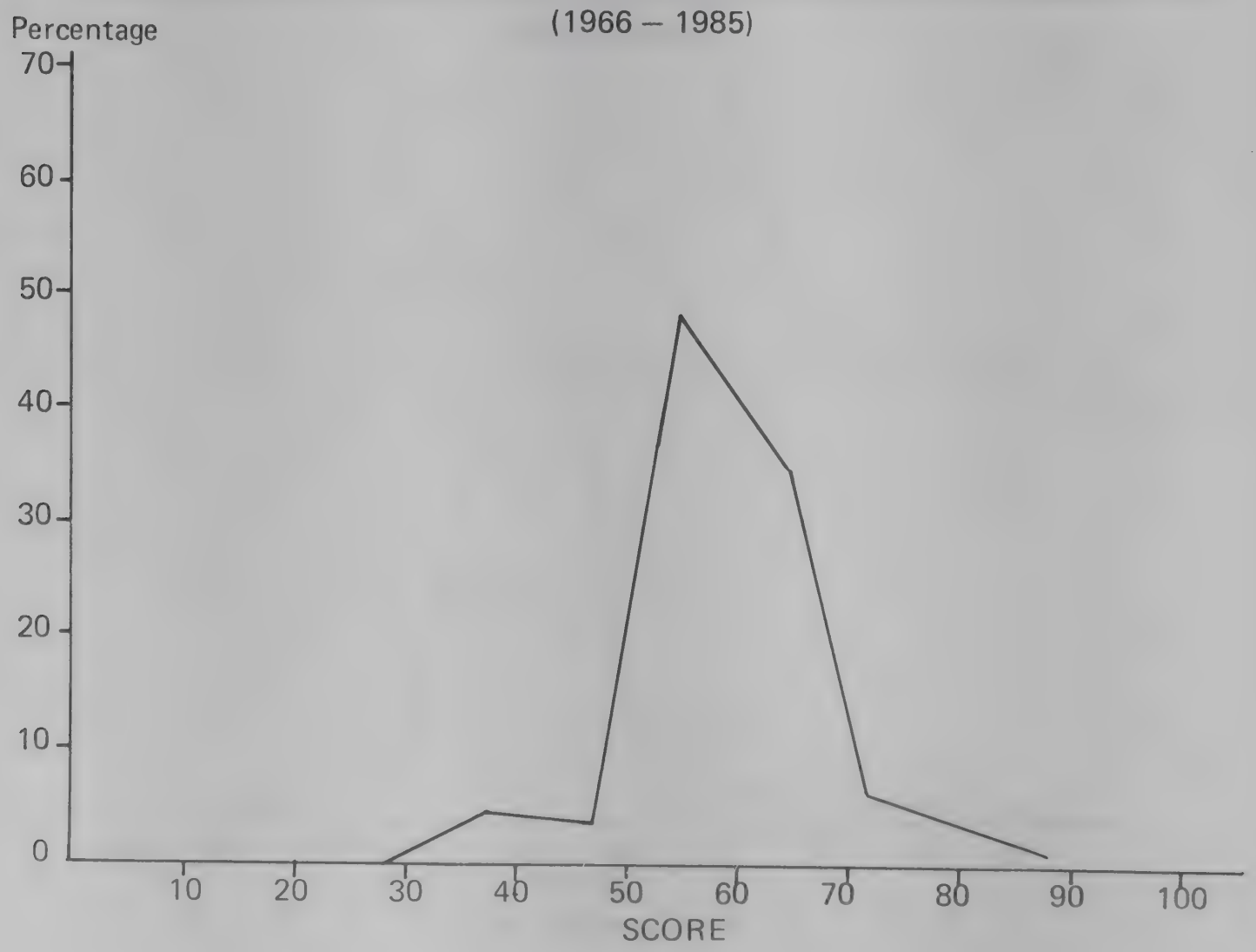

FIGURE 5

MCQ 1 & MCQ 2 SCORES FREQUENCY
DISTRIBUTION OF THE 3RD PROFESSIONAL
EXAMINATION (1969 – 1984)

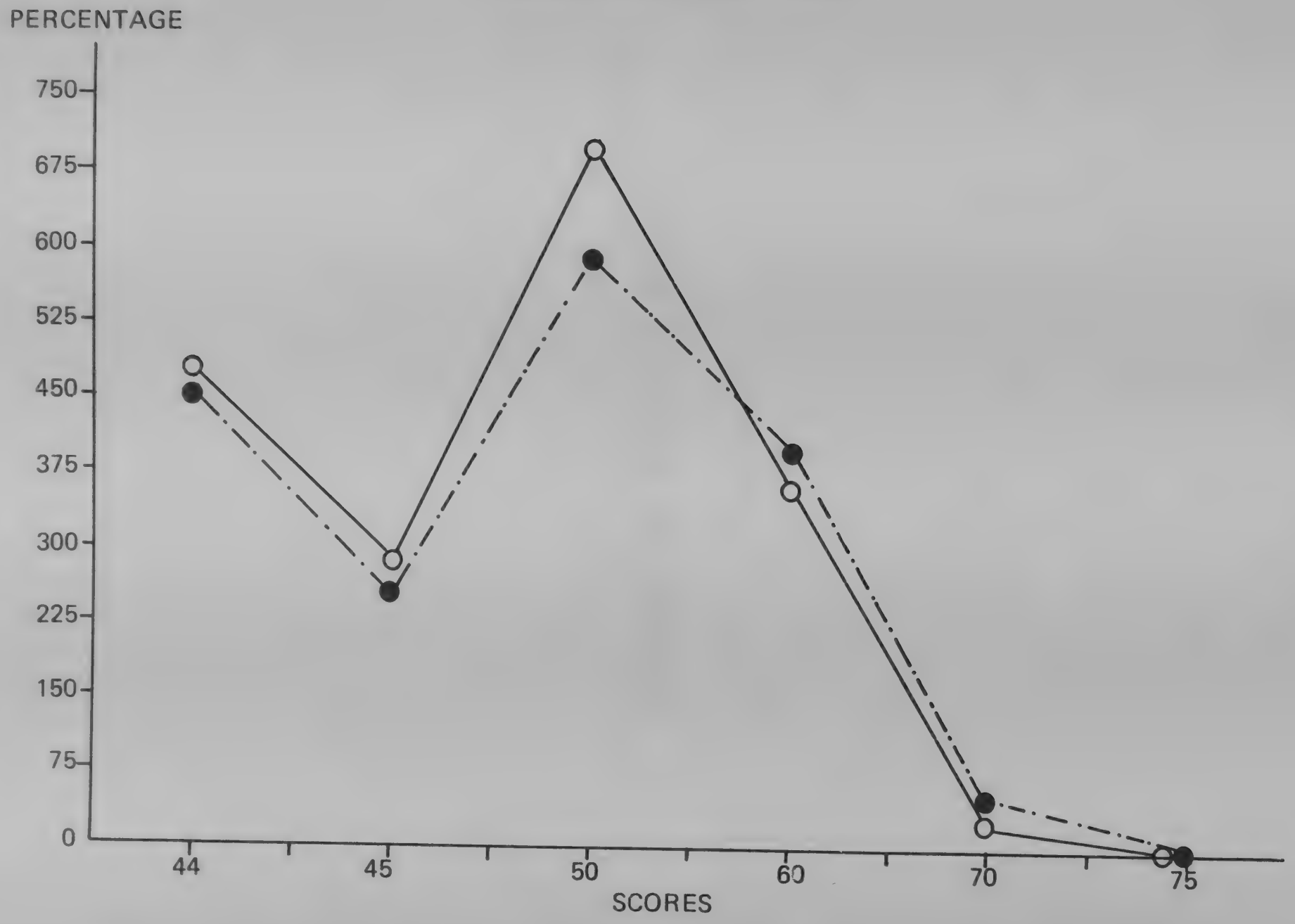

FIGURE 6

FREE PAPER SESSION

THE ROLE OF INPATIENT PSYCHIATRIC CONSULTATION IN UNDERGRADUATE MEDICAL EDUCATION

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ABSTRACT

The psychiatric consultation from other units in a teaching hospital provides an opportunity for final year medical students to clerk patients and interview their families. The DSM-III five-axial diagnostic approach helps students to organise their material. Case presentation, discussion and observing their clinical teachers conducting interviews and planning of management enables them to integrate the bio-psychosocial information and management. Students feel that they appreciate the relevance of psychosocial factors and psychiatry to general medicine much more than the traditional clerking of psychiatric patients. Through cognitive, problem-solving approach from the gathering of relevant data through planning and flexible participation in management, learning becomes active and informal.

The titles of two books published on both sides of the Atlantic Ocean in English language in the last decade are the evidences of the evolution and increasing necessity of practicing and teaching the concepts of psychosomatic, holistic and biopsychosocial aspects of medicine. "Consultation-liaison psychiatry" was edited by Pasnau (1975), then Chief, Psychiatric Consultation-Liaison Service, University of California, School of Medicine, Los Angeles, California. Pasnau, in introducing the four chapters in the fourth section of this book on Liaison Psychiatry and Medical Education commented that "the role of liaison psychiatry in the education of medical students, family practitioners, psychiatric residents and practicing physicians have received only the passing interest and attention of medical educators." "Medicine and psychiatry : a practical approach" is edited by Creed and Pfeffer (1982), consultant psychiatrists at the Manchester Royal Infirmary and the London Hospital respectively. In the chapter on "Teaching psychiatry as part of medicine", they referred extensively to the six aims of teaching of psychiatry relevant to medicine discussed in an earlier conference on undergraduate education in psychiatry in the United Kingdom (Wolff et al, 1971):-

(1) motivation on interest in the psychosocial aspects of illness alongside with the students' growing knowledge of the biological aspects; (2) a flexible approach to the teaching of psychological perceptiveness and sensitivity; (3) the objective aspects of behaviour; (4) the doctor-patient relationship and interviewing skills; (5) treatment skills and (6) factual knowledge of psychiatric aspects.

The general hospital setting provides numerous opportunities to teach students the interaction of psychosocial and organic factors in illness and disease, the doctor-patient relationship and management of patients.

Description of a Malaysian Setting

In Malaysia, about one per cent of the approximately four thousand two hundred (4,200) registered medical practitioners are psychiatrists. Of the forty-two (42) psychiatrists, ten are in the Universiti Kebangsaan Malaysia working in the Kuala Lumpur General Hospital which has only one Ministry of Health psychiatrist, six are in the University Hospital, Kuala Lumpur and two at the University Hospital, Kubang Kerian, Kelantan.

Medical sociology and anthropology, cultural values and systems of delivery of health services are important components in curriculum of Social and Preventive Medicine taught in the first four years of the Faculty of Medicine, University of Malaya, Kuala Lumpur. During the five weeks of posting at a Ministry of Health District Hospital, sixty (60) kilometers from the University, there is a comprehensive continuous health care (CCHC) conference on a patient every Saturday organized by two staff from the Department of Social and Preventive Medicine (a public health nurse who is the liaison officer and an academic staff) and a clinical department. There are a series of five psychological lectures in Year II, a series of about six hours in Interview Techniques and Introduction to Clinical Medicine course in Year III followed by a series of eight (8) hours of lectures in psychiatric syndromes and psychological reactions. In Year IV, the students do four (4) weeks of Psychological Medicine clerkship interviewing patients and their families. They also attend a series of ten lectures in psychiatric syndromes and psychological reactions. At the current stage of national history, not all patients can communicate in the national language. A student who speaks a language which the patient can understand or a nurse may help out in the history.

From 1967 — 1976, Year IV and V medical students clerked only psychiatric patients in the 56-bedded psychiatric wards and out-patients in the psychiatric clinic during their four and five weeks, respectively of their Psychological Medicine posting. They also clerked some patients in the Accidents and Emergency Unit. From 1971, the Year V students also rotated weekly through the Psychiatric Day Care Centre. In 1977, one of the authors (WTH) decided to allow students to clerk the referred inpatients from other units in the hospital unless the students and consultants felt that the patients refused to be interviewed by medical students or the mental states of the patients required immediate attention of the consultants or a medical officer or lecturer. As a result of the policy of joint management, by medical and psychiatric medical officers for the patients who attempted suicides, very few patients had been referred to the consultants. Whenever in doubt, the medical officers discussed the patients with their respective lecturers or transferred them to the psychiatric ward. From 1981 onwards, when one of the psychiatric consultants, Dr. M.P. Deva returned from his sabbatical leave from North America, the DSM-III diagnostic concepts were introduced in our teaching and patient care.

In 1974, 192 patients (0.95% of total inpatients in the University Hospital in

1974) and the following year, 182 patients (0.7%) of the total inpatients were referred. Excluding the 83 patients with attempted suicides who were jointly managed by the medical officers and lecturers of the medical and psychiatric units, about fifteen per cent (15%) of the remaining 178 referrals were patients who had no known physical illness to account for physical symptoms. Twenty-four per cent (24%) were for assessment of anxiety and depression, 30% were referred for advice on psychiatric management while they were managed for their physical illness, and 20% were referred for behavioural problems (Woon and Dass, 1978).

Method of Consultation and Undergraduate Education

The final year medical students on duty for consultation would check for any consultation forms sent to the psychiatric ward. He may call or page for the consultant to discuss the patient first if he were to be uncertain of how to proceed. Generally, he clerked the patient and interviewed a relative during visiting hours in the evening. Thus a roster is scheduled for the student to do "on-call" duty for the day.

The students are also encouraged to review the charts (medical folders) of the patients — attempting to integrate the physical symptoms and examination, biophysical and chemical investigations, the illness and disease, the management in the ward and the medications prescribed. Some students are able to get further information from the nursing staff. Most students are able to summarise their findings and appreciate the usefulness of DSM-III in a holistic approach of medical diagnoses and understanding of the psychosocial background of the patient.

Occasionally, a consultant may receive an urgent request by telephone first. The student concerned may then be called to tag along and observe the consultant interviewing and manage the patient.

The following are two examples of the type of referred patients:

Example A:

A young female with torticollis of two years' duration was referred by an orthopaedic surgeon. A psychogenic aetiology was suspected.

A gradual onset of right-sided spasm of the neck, with a slow progression to the present sustained torticollis was the presenting complaint. She had given up her studies at an early stage and did not go to work. She had always been the passive recipient of support from her family who took care of all her needs. She did not leave her home often and socialization with others was minimal. The rest of the family accepted this situation and no unusual stresses in the family were created by this unusual behaviour.

The student was overwhelmed by the psychosocial history and confidently diagnosed the condition as psychogenic pain disorder.

The consultant (SM) noted that the history of the disorder was of two years' duration and no unusual stressful factor was associated with the onset of her

condition. The spasmodic torticollis was of gradual onset, progressive and had now become persistent. Her personality disorder clearly preceeded the onset of her complaint. No psychogenic factor including secondary gain could be demonstrated, which might perpetuate her condition. She was not entirely indifferent to her condition and demonstrated discomfort and uneasiness. This latter is not strong evidence but is to be taken together with other findings.

All these factors taken together would very likely exclude a psychogenic aetiology (hyterical conversion)

The orthopaedic surgeon was advised to refer to the neurologist. A diagnosis of spasmodic torticollis of organic origin was made by the neurologist.

The student learns several facts from this particular consultation. Psychopathology is widespread and its occurrence need not necessarily be related to a disorder. A diagnosis of hysterical disorder (or psychogenic pain disorder) needs a great deal of caution. Spasmodic torticollis is in most cases an organic disorder and though a psychogenic simulation of this order is possible, it can only be clearly established, if positive psychiatric factors can be demonstrated.

Example B:

A 29-year old housewife was referred for psychological management for her frequent asthmatic attacks. These attacks had worsened over the last one and a half years — the period when her marital problems had worsened too since her marriage in December 1984. She had three admissions at University Hospital in January, February and early June 1986 for asthmatic attacks and had visited the Accidents and Emergency Unit three times in March, April and May 1986. She had asthma since twenty years old. Her attacks were precipitated by dust, flowers, heavy work, flu and emotional stresses, especially fighting with her husband. She has had three miscarriages after marriage.

She had attempted suicide at the age of 22 years after a quarrel with her mother and in May 1985 when she wanted to jump into a pond after her quarrel with her husband.

A DSM-III multiaxial system of provisional diagnoses (American Psychiatric Association, 1980) is as follows: Axis I : 316.00 — Psychological factors affecting physical condition — V61.10 — marital problem; Axis II : Personality traits — immature, histrionic; Axis III : Asthma (with exacerbation) and frequent abortions; Axis IV : Moderate psychosocial stresses and marital discord and worried about pregnancy; Axis V : Fair level of adaptive functioning over the last one year.

During her recent hospitalisation, she again aborted in the ward. She confided in the nurse that she had taken some traditional medicine for abortion. Just prior to her leave from the ward, she developed another asthmatic attack after another quarrel with her husband. There is minimal social support from her family who stayed about 120 kilometers away and there was no social support from her in-laws. Two medical students, Miss

Malini Tharmanason and Cik Rahimah bte. Ahmad made a home-visit with Miss Barbara Yen the medical social worker.

Physical management included intravenous drip of aminophylline 250 mg and hydrocortisone 200 mg. six-hourly. Primary and secondary prevention included referral of the patient and her husband to a Family Planning Clinic within the hospital and accepting the patient in our Psychiatric Day Care Centre for individuals and group counselling. She was also taught relaxation exercises. Later, she may begin formal rehabilitation at our Sheltered Workshop prior to helping her to find employment again.

DISCUSSION:

Different systems of medical care, the availability of staff (academic and clinical), staff to students ratio, the administration of the medical faculty, support from the University and community not only contribute to the varieties of intake of students and quality of academic staff but how scientific medicine and humanistic approach are integrated. The need to integrate theoretical knowledge and clinical medicine, the different approaches in the assessment and management of a patient has stimulated different models of integrated teaching programmes.

A medical student may also learn to dehumanize a patient as she proceeds to clinical years. Some physicians learn to insulate themselves from the unpleasant realities of many human conditions. They remain in their specialized roles e.g. looking at the charts and did not interact with their patients (Comstock and William, 1980). Students need to know where to seek appropriate help for the patient concerned. Members in patient's social network or another medical social worker, or members of the medical team may be of help. The inpatient psychiatric consultation enables the students to discuss this with the psychiatrists.

In the Malaysian context, housemen may be in hospitals where no social workers nor psychiatrists are available and the volume of clinical service may not be feasible for close supervision by a senior staff. After housemanship, the majority of the medical officers have to work for three more years of compulsory service in rural communities, small towns or district hospitals, without the availability of medical social workers nor psychiatrists. If they are resourceful, the nursing staff, including public health nurses, local community workers are glad to assist in patient management. He has to set the example of a good leader of his health team. Thus, some skills in actual planning of management of patients need to be demonstrated to the final year medical students. The inpatient psychiatric consultation also provides an opportunity to teach students to care for patients. Dr. Francis Peabody wrote that: "One of the essential qualities of the clinician is interest in humanity, for the secret of care for the patient is caring for the patient." (Comstock and Williams, 1980).

In our University Hospital system, senior staff (consultant level) are in charge of consultation. We are prompt in our response to request for consultation. The bed-side consultation with recognition of privacy or interview in a room in the ward, occasionally allows opportunities for the consultant to call other students

doing their posting in those wards to sit in. The innocent question of a Year IV medical student who was invited to sit in during consultation for the patient in Example B: "This patient really has asthma. I don't know why she should be referred to psychological medicine!" provides an opportunity for one of the authors (WTH) to show how physical diseases may be aggravated by psychosocial stresses.

The use of the Year V medical students to serve in the capacity of an initial assessor of these referred patients and to suggest plans for management provides opportunities for bed-side teaching by senior staff. The time involved may be at least twice the time involved but occasionally the information gathered are more than what the busy consultants may obtain. Not only does a consultant interview the patient, reviews his chart but where appropriate, he will physically examine the patients. The consultant thus demonstrates to the student. The students are told why certain information need to be clarified. For some patients, the students observe that individual or family counselling is being practiced during the interview — combining history-taking with therapeutic intervention. Verbal feedbacks are given to the consultee by the consultant occasionally with the students around. The students are also encouraged to read the brief reply to the request for consultation.

Teaching consultation and liaison psychiatry is a very time-consuming practice. An intensive paediatric child psychiatry liaison programme stopped after one of the psychiatrists left the service (Greenberg and Rice, 1980). Their paper also showed how important it was to get the full support of the paediatric service concerned for the liaison programme to start and continue. We are grateful to our consultees for contributing to our teaching by their referral. Where there are adequate psychiatric staff, a liaison psychiatrist is given the liberty to choose any patient for assessment. His feedback will contribute to better service and teaching. The best place to teach biopsychosocial approach in medical practice is in the medical wards.

Medical educators are aware of need to be flexible in teaching students to be perceptive about the psychological and social needs of the patients and the anxiety aroused in the students. The temperament and aptitude of the students (and the primary doctors who care for the patient) varies. In a few instances, where the students are motivated and opportunity exists for brief supportive psychotherapy; the students help in the psychotherapeutic management of the patients. While the responsibility for the management rests with the consultee (unless the request is for transfer or where transfer is indicated), the responsibility for brief individual or family therapy may be undertaken by the psychiatric consultant. In most instances, the students are encouraged to follow-up the patients in the ward. William's (1981) discussion on teaching residents through consultation provides useful insight into the teaching of final year medical students. Some patients definitely present problems which exceeded the students' ability to analyse and synthesize information on which tentative management and decisions can be made.

Students feel that liaison-consultation psychiatry helps them to appreciate the relevance of psychosocial factors and psychiatry to general medicine much more than the traditional clerking of psychiatric patients. Through cognitive,

problem-solving approach from the gathering of relevant data through planning and flexible participation in management, learning becomes active and informal. For some final year medical students and the consultants involved, the collaborative consultation enabled problem-based discussion with colleagues to take place — for better patient care. For others since the 1986/87 session, we schedule at least one patient referred for inpatient psychiatric consultation for the Year IV and Year V combined conference for the thirty over medical students doing their concurrent psychological medicine postings.

"Tomorrow's Physicians : Today" is the theme of this International Conference on Medical Education. The medical students enable "Yesterday's medical students : Today's consultants" in this instance, to participate in a life-long continuous education. Some final year medical students frequently demonstrate their up-to-date scientific medical knowledge as well as compassion for their patients. We hope that they continue to learn and practice comprehensive medicine as they face the challenges of modern medical care for some impatient, anxious, hostile, but also sick patients of different ages, intelligence and cultural backgrounds.

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AN INTEGRATED PROBLEM BASED APPROACH TO NEUROLOGY

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Over the past decade constant attempts have been made to construct courses that improve the standard of medical education. The principal newer trends have been towards 'integration' and problem based learning.[1] Different types of integration have been practised ranging from a limited one confined to a common subject, to a total restructuring of the medical curriculum removing all conceptual barriers between disciplines and pre-clinical and clinical areas.[2] In conventional medical education, the topic of Neurology is taught in a phased manner, the basic sciences being introduced separately in the early pre-clinical stage and the clinical component at a later stage towards the end of the medical course. Neurology is traditionally regarded as a 'difficult' subject to teach, learn and practise. The practise of Neurology entails the making of first an anatomic diagnosis, then a pathological diagnosis and finally a functional assessment in terms of the patient's management. These facts emphasise the need for an integration of the pre clinical and clinical components and presentation of the complex material in a manner that facilitates a clear concept of the field of Neurology. Recent advances in brain research in the areas of hemispheric specialisation for information processing have been found to have implications for fundamental changes in education.[3] An emerging trend is the need to educate both the left and right cerebral hemispheres through verbal and visual learning respectively. Based on the above principles an integrated, problem based system with emphasis on both verbal and visual learning has been evolved and used in the School of Medical Sciences, Universiti Sains Malaysia. In this system, basic neuroanatomy and physiology were integrated with clinical Neurology and incorporated sequentially into clinical 'problems' to be 'solved' by medical students. The system is described:

METHOD

The subject of Neurology was planned as a 'block' of 6 weeks duration to be covered in the phase II (2 & 3 years) of the medical curriculum. The 'block' was further subdivided into 6 'problems' each of a week's duration. Specific objectives had to be realised at the end of each problem and at the end of the block. These objectives encompassed the structure and function of the entire nervous system as well as covered a spectrum of common congenital, traumatic, inflammatory, neoplastic, vascular, metabolic, toxic, demyelinating, degenerative and autoimmune disorders affecting it. Each problem was initiated by a visual 'trigger material' in the form of a videotape of a patient. The content of knowledge for each problem was subsequently delivered through a series of learning units that comprised of small group discussions, fixed learning modules, a few key lectures and clinical demonstrations. An example is shown in Table I.

The construction of the problems was devised on the concept that the nervous system consists of contiguos subunits with related structure and function oriented longitudinally as the 'neuraxis' (Fig. 1). Each problem covered one or more related subunits and an appropriate disease entity most common in the geographical setting. During the problem solving exercise the relevant anatomy, physiology, pathology, clinical aspects and related pharmacology of each subunit would be imbibed by the student. Within the Neurology block, the sequential 'flow' of problems was designed as a centripetal ascent along the neuraxis from the peripheral to the central nervous system (Fig. 1): The student was 'transmitted' as it were from the receptors through the peripheral nerves, spinal cord, brainstem and diencephalon to the cerebral cortex, touching 'areas' like cranial nerves, basal ganglia and cerebellum along the way. The logical flow of the learning process was further enhanced by a smooth transition from Neurology to Psychiatry by the interposition of a neuropsychiatric problem (dementia) in between.

The efficacy of the above programme was assessed at the end of each problem, end of the block, end of the year and at the end of the medical course: Multiple choice questions (MCQ), modified essay questions (MEQ), objective structured clinical examination (OSCE) and clinical case presentations were the methods of assessment used.

RESULTS

Serial assessments of the students during and at the end of the medical course revealed that the above system had certain advantages over the traditional method: The use of clinical problems emphasised the relevance and importance of all the material presented and its immediate use reinforced and consolidated the learning process. As regards the objectives, the students acquired a reasonable ability to do a clinical neurological examination, interpret abnormal findings and plan a course of investigation and treatment when faced with a patient. However it was felt that an adequate knowledge of basic neuroanatomy and physiology had not been attained. The system also was 'costly' in terms of the large amount of time spent by the staff in the preparation of the integrated course. The implementation of the system also required a large number of teaching staff who are familiar with the subject being taught.

DISCUSSION

The traditional method overburdens students with vast amounts of neuro-anatomy and physiology: The student often learns these subjects not knowing what they are intended for. By the time clinical Neurology is taught, the basic sciences are forgotten. In the present method an attempt was made to overcome the above setbacks by an integrated, problem based approach. The results indicate that while the method was effective in developing the clinical problem solving skills in students, it left gaps in the knowledge of basic sciences. Many reasons can be attributed for the above deficiency. The students tended to concentrate on the clinical component and ignore the basic sciences. The period of 6 weeks was insufficient to cover the objectives. In traditional medical schools, approximately a month is spent in the dissection of the brain and neurophysiology is taught over a period of four to six weeks.

For effective delivery, the integrated system should at least extend for a period of 3 months. Lack of sufficient teachers familiar with the field of Neurology was another contributory factor. The teaching-learning modules that evoked the maximum interest in the students were the small group sessions, clinical demonstrations and a system of 'video-lectures' in which a videotape of a patient with a neurological disorder was followed by a brief lecture on the topic.

There is a constant need to revise and devise an 'ideal' method of teaching the complex subject of Neurology. As any scientific field progresses from its initial descriptive phase to analytic maturity, typically a major change occurs in the teaching techniques required to introduce newcomers to the field. This change entails the construction of a teaching sequence designed to introduce the field with maximal clarity, minimal ambiguity and in the shortest possible succession of logical steps.[4] In this context it should be emphasised that during learning, the left and right cerebral hemisphere process information in different and multiple ways.[5] The art of teaching needs to devise sophisticated ways to facilitate the multiple processing systems of the brain. This objective should be realised by diversity in curricula and methods utilising both verbal and visuo-spatial learning techniques.

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Fig. 1

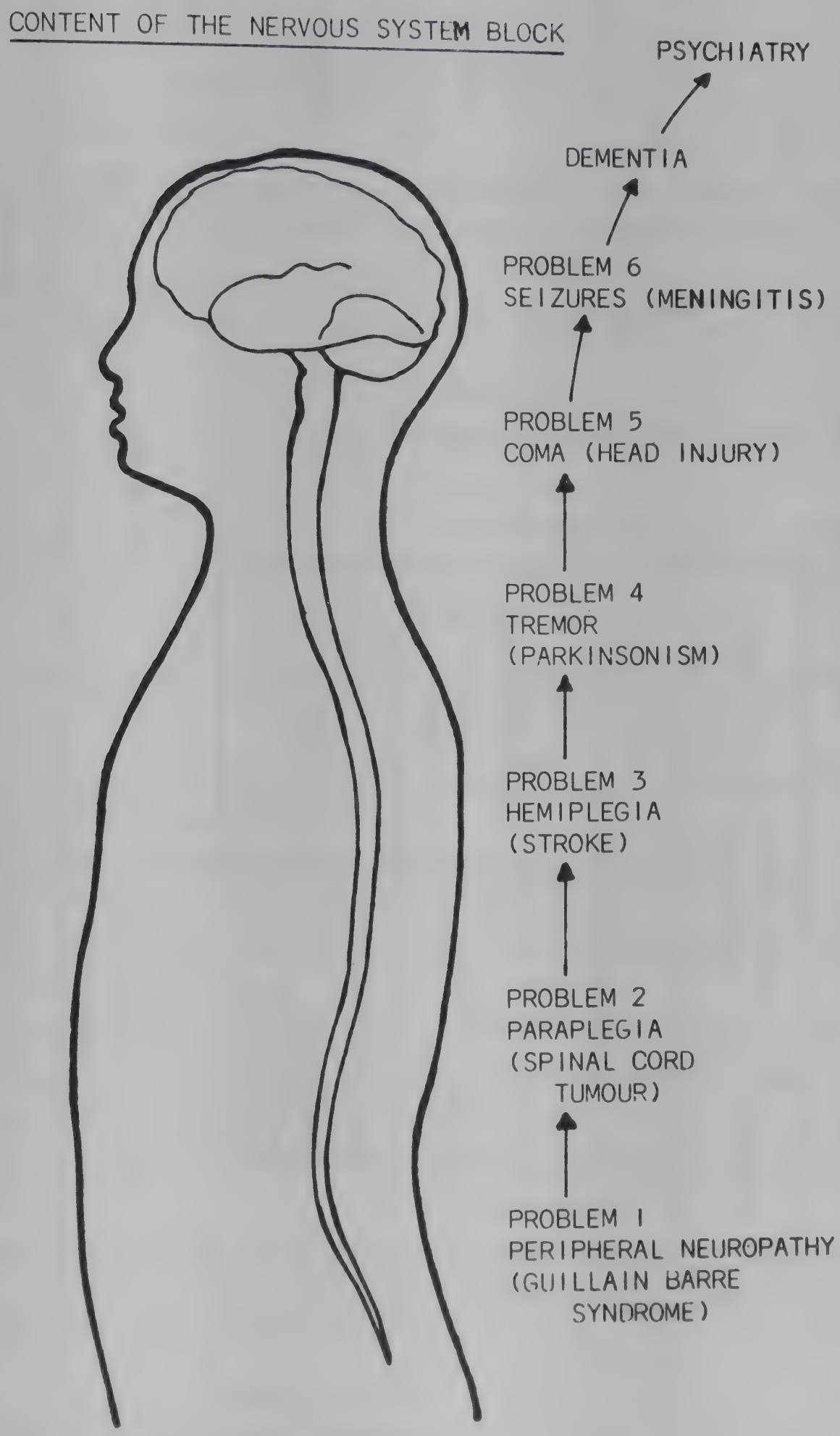
CONTENT OF THE NERVOUS SYSTEM BLOCK
PSYCHIATRY
DEMENTIA
PROBLEM 6
SEIZURES (MENINGITIS)
PROBLEM 5
COMA (HEAD INJURY)
PROBLEM 4
TREMOR
(PARKINSONISM)
PROBLEM 3
HEMIPLEGIA
(STROKE)
PROBLEM 2
PARAPLEGIA
(SPINAL CORD
TUMOUR)
PROBLEM 1
PERIPHERAL NEUROPATHY
(GUILLAIN BARRE
SYNDROME)

TABLE I

BLOCK : NERVOUS SYSTEM : PROBLEM : PARAPLEGIA

		8	9	10	11	12	12.30	2	3	4	5
	MON		BRIEFING	VIDEO TAPE ON PARAPLEGIA		PBL 1		*FLM*			
	TUES		COMMUNITY MEDICINE					*FLM* Microbiology) Pathology) of spinal cord Radiology) diseases			
	WED		(L) AUTOMATIC REFLEXES	PBL 2	*STAFF SEMINAR* Motor Neuron Disease			CLINICAL TEACHING			
	THURS		*PANEL DISCUSSION* — Spinal Shock — Spasticity and its treatment		PBL 3			CLINICAL TEACHING			
	FRI		PBL 4	(L) CLINICAL APPROACH TO PARAPLEGIA	SELF STUDY			ASSESSMENT & FEEDBACK			
	SAT		COMMUNITY MEDICINE								

PBL — Problem based learning by small group discussion

FLM — Fixed Learning Module

L — Lecture

THE PROFILE OF ELECTIVE PROGRAMS IN THE CURRICULUM DESIGN OF THE MEDICAL SCHOOL AT USM, PENANG

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Key words: SPICES, group dynamics, leadership, critical thinking, research, Ministry of Health, student initiative, student participation.

The objectives of the Elective program is interwoven with the objectives of the SPICES educational model. It would be expected because part of SPICES is Electives ie. :

S	—	Student centred
P	—	Problem based
I	—	Integrated
C	—	Community oriented
E	—	ELECTIVES
S	—	Systematic

However, the program has an identity of its own. The objectives of the programs are to:

1.0 allow students a 'breather' in an otherwise full content curriculum so that they can pursue a topic of their interest.

2.0 enable them to appreciate the benefits of group dynamics when they perform as team members or as group leaders.

3.0 cultivate critical thinking and learn how to retreive and apply informative gathered (report writing).

4.0 accommodate topics of recent interest in medicine and research.

5.0 take some time to work with the Ministry of Health and see the actual primary health-care system of the country.

6.0 provide a time-slot in case students wished to further their learning process at their own pace.

The Elective is tailored to blend with the curriculum design as pre-packaged units. The positioning of these units in the respective academic year is planned with Curriculum Committee. The current plan is:

Year 1	:	2 weeks program
Year 2	:	5 weeks program
Year 3	:	5 weeks program
Year 4	:	6 weeks program

The programs are placed in the later part of each academic year so that students have adequate exposure to the current academic contents if they wished to study any of these topics in-depth during the Electives. Growing emphasis is placed on students to draft their program so that the programs will truly be student-centred and involve active student participation.

After the program began in 1979 it has been evaluated twice. The recent evaluation was mainly to monitor student responses. A 30 statement feedback type of questionnaire was given to Year 2 students. The questionnaire was assessed on a Likert scale. Out of the 92 questionnaires distributed 89 were returned.

The significant responses were: (see appendix A).

To conclude, it can be said that the placing of the program and its objectives have been found to be satisfactory for the present needs in the curriculum. However, trends are emerging to expand the spectrums of titles that can be undertaken under the Elective umbrella.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. Elective should continue to be included in the PPSP orientation programme	18	45	7	8	3
2. Team spirit is lacking in my team	6	17	16	30	13
3. The assessment of Electives should contribute towards Professional Examination	8	23	9	20	22
4. Students who change their elective program after closing date should be penalised	5	11	12	33	19
5. An award should be presented to the best student in electives	10	31	13	17	10
6. I fell that assessment in electives is not necessary	17	34	11	14	3
7. I prefer to learn more about 'core' subjects during the Elective	15	36	18	10	0
8. I learn a lot from doing electives	11	43	14	10	3
9. I find doing electives enjoyable	14	36	18	8	4
10. Students with poor academic profile must be allowed to do Remedial Electives	18	31	11	15	6
11. The information provided in the handbook is easily understood	3	25	19	22	5
12. The elective helped to better my clinical skill	10	47	7	7	6
13. I found the elective useful	14	53	7	3	2

PROBLEM BASED LEARNING AT THE ARABIAN GULF UNIVERSITY, BAHRAIN

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The College of Medicine in Bahrain is the first faculty of the Arabian Gulf University to be established jointly by the seven Arab States in the region — Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. From the outset it was decided that only a curriculum with innovative orientation could be justified in a region with several conventional schools.

The Institutional Philosophy was formulated in Feb 1982 by a symposium of Medical School Deans and Under Secretaries of Health in the region with the guidance of educationists from innovative schools and the World Health Organisation. It was agreed that the functional Curriculum should reflect the health care needs and the social cultural and ecological patterns of the region.

The guiding principles of the Institutional Philosophy are as follows:

At the time of graduation, a student of the College of Medicine and Medical Sciences (CMMS) would be equipped to respond to the needs and demands of the Arabian Gulf Region.

Learning experiences are designed to take place in the community itself, and peripheral health facilities to be used rather than restricting learning only to what happens in large hospitals.

An early exposure to the real problems to maintain student motivation and create interest is planned for students to see for themselves the relevance of what they study.

The college will actively collaborate with the Ministry of Health, Bahrain and other ministries in the area, to provide training facilities for students.

Emphasis is on the team approach to problem solving where various members of the health team bring their own expertise to solve a problem with mutal respect.

By selecting study problems relevant to community needs education becomes relevant rather than focussed on memorising a massive amount of disjointed information which is usually forgotten if not actively used in the practice of the medical profession.

The programme should treat students as responsible learners by providing opportunities for self-instruction, independent study and self evaluation. The focus of instructional process should be on the student activities rather than on the teaching activities performed by the faculty.

The student should participate in the planning and evaluation of his learning activities. This would imply a gradually increasing participation in decision-making bodies concerned with curriculum design and assessment.

The learning activities are organised to ensure that students intergrate all relevant knowledge across disciplines, especially between the traditional 'basic sciences' and 'clinical' ones in order to facilitate both the development of an intergrated and wholistic perspective of health problems.

A system of continuous feedback to be established for both the students and the faculty to improve the effectiveness of the curriculum implementation process.

STUDENT SELECTION

The first batch of students were admitted to the programme in Oct 1984 after two years of premedical training at the University College, Bahrain, with a few mature students with previous training in related fields admitted on a direct entry examination. Selection was based on a predetermined ratio to include students from all seven states. The Premedical Curriculum is at present conducted by the Arabian Gulf University (AGU), and is in a process of transition to suit the demands of the problem based programme in medicine.

EDUCATIONAL OBJECTIVES

A defined list of outcomes expected of a student graduating from the institution has been made available to both students and staff. The broad goals as given are as follows — The student at the end of completion of the programme should be able to:

Demonstrate professional competence in dealing with a patient.

Practice preventive medicine.

Work as a member of the Health Team.

Participate in research programmes.

Keep himself up to date by continuous learning.

Participate in comprehensive health care planning.

Plan, implement and evaluate educational programmes for the community.

These objectives have been further amplified to promote more specific outcomes (Appendix I).

Organisational Structure

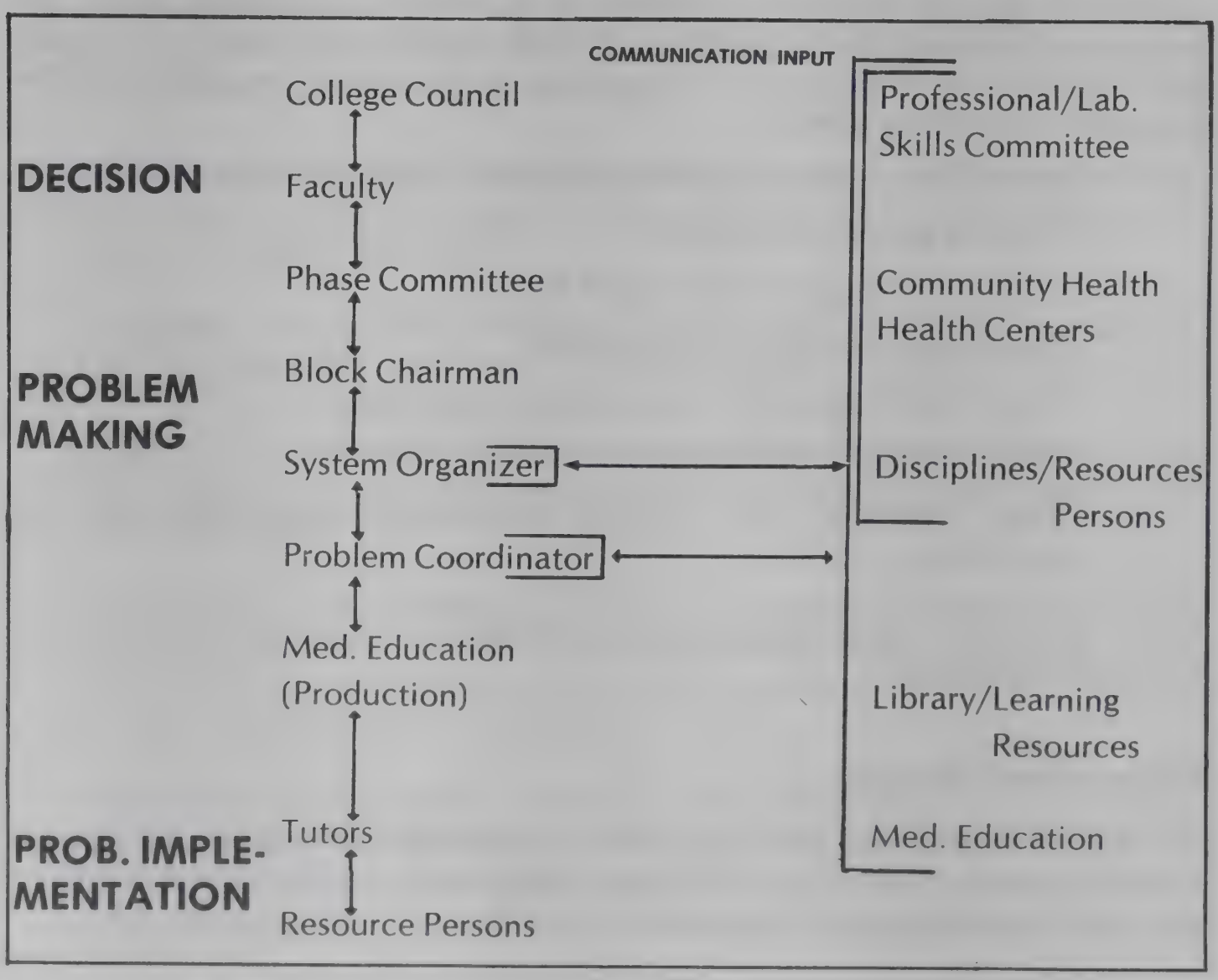
The main policy making body of the faculty is the Faculty Council. The Faculty Council consists of the Dean, Division Chairpersons, a few elected members and representatives from the Ministry of Health.

For convenience in administration, resource sharing, research programme and post-graduate training, the faculty is divided into four administrative divisions namely — Human Function, Human Structure, Human Behavior and Education. Each member of the academic staff is attached to one of these divisions according to his interest and expertise. Each division has members from both basic and clinical disciplines (Appendix 2). This organisational structure is intended to bring about intergration of basic and clinical sciences and to promote communication across conventional disciplines. The medical curriculum is a collaborative effort of functional committees with representatives from the different divisions.

The faculty consists of full time staff members and part time clinical staff from the teaching hospitals and the private sector. The nature of the responsibility and the committment of the part time staff provides for better co-ordination of the Ministry of Health and the University. This should be considered as an example of efficient utilisation of available resources.

Curricular Dynamics

Health problems for study are selected by the year committees according to well defined criteria which reflects the institutional philosophy. The committees with appropriate input from subject specialists delineate specific objectives for each health problem. A list of problem objectives are given to the Block/System Co-ordinator who will identify one person as problem co-ordinator to be directly responsible for writing the problem. The nature of this process, with interaction of several members of the staff in the making of a problem at different stages, should be considered a unique feature.



The problems written for the first two years of the medical programme follow a specific format. The final document consists of:

- **Tutor Guide** to assist the tutor during tutorials
- **Triggers** to enable students to formulate hypothesis, request for further information and identify learning needs
- **Learning Objectives** which specify expected outcomes from the student
- **Learning Resources** which guides him with references, Handouts, resource people and other resource materials such as audio visual programs, specimens etc.
- **Mini Problems** to reinforce the learning of objectives under study and to introduce related problems in the same area.

Each problem is expected to be solved by a small group of students during one week. The materials are conveniently arranged in a sequence to permit group discussion, independent study, meeting with resource people and working on mini problems in the final session.

No formal lectures are given during this programme. Each week the students have two large group discussion in the form of a planned resource session and a problem review session to reinforce learning and to clarify difficulties encountered by students. They are encouraged to meet with resource people identified for each problem to receive guidance in learning.

The whole curriculum could be conveniently considered in three phases. Each year is divided into four Blocks. The first phase consists of two blocks, the Community Health and Concepts, The second phase consists of 12 Blocks with indepth study of the problems according to systems with Professional Skills and Community Skills to correspond with the health problems. The third phase consists of the last two years with intergrated practice which corresponds to the clinical clerkships in all required disciplines as in the conventional curriculum.

Clinical training commences with the first problem they encounter in their training. On the second block students are given a workshop on communication skills followed by visits to Hospital/Health Centres. When they start with the system based problems they go through a clinical methods programme, which runs parallel with the problem understudy. This programme is arranged collectively by the Professional Skills Committee in co-ordination with the committee on Health Centre Training.

Each year the programme is reviewed by the respective committee and finally by the whole faculty. Experience with this curriculum suggests that each problem needed modification in some form or other. Although this may be frustating to some staff members, it should be emphasised that curriculum development is a dynamic process and continuous refinement is inherent in this system.

Student Evaluation

The assessment strategies are directed to support the aims of the college. Formative assessment after each block is used to give feedback to the student on his strengths and weaknesses. It also serves the purpose of familiarising the student on the style adopted in final assessment. The way formative assessment is conducted, only the individual student will know his/her results with a secret code number. If any student has any deficiencies in specified areas he/she is encouraged to meet the resource people.

Yearly Summative assessments are held to make decisions about student remediation, progression, graduation and/or exclusion. Student performances are judged as "satisfactory" or "unsatisfactory". The criteria for a satisfactory response would be decided in advance in the future.

Multiple assessment techniques are used for providing student feedback and certification. Objective examinations of different types are used to increase reliability and content validity. Short answer questions are also used to give opportunities for students to directly respond to questions which are not always amenable to MCD format. Computerised patient simulations have been tried to provide a more realistic problem solving situation. Skills in identification and recognition in relation to specimens, slides, x-rays etc are tested by Objective Structured Practical Examinations (OSPE).

A yearly Professional Skills examination is conducted to assess the extent of the students' achievement of specified psychomotor objectives. The assessment is well structured with elaborate check lists marked by two independent clinical examiners.

Conclusion

At present the students have gone through two years of training in the medical programme. Initial anxieties of the students and the staff about the new curriculum are generally relieved. But still some staff members find it difficult to forget their past experience with the lecture system of instruction. Clinical teachers also tend to follow the conventional clinical assessment system where the examiner concentrates on the interview focusing on cognitive aspects which could be assessed elsewhere by reliable methods. We are in the process of developing learning resources to suit the objectives of the problem based curriculum. Our assessment techniques are to be refined with remedial facilities for students. Although we have accepted criterion referenced testing as the suitable method, only little progress is made in defining the criterion. Our Staff development programme includes visits to innovative schools which should facilitate into recognising our own strengths, and consider alternative strategies on weak areas.

APPENDIX I

OBJECTIVES

The purpose of the Medical Education Programme is to train an undifferentiated physician, who is capable of providing comprehensive health care at the highest standards to the people of the Gulf region, and is capable of pursuing further specialty training in any field of medicine and medical science. The graduates if this programme, at the end of their training, will:

1. Demonstrate Professional Competence in Dealing with a Patient:

A. Diagnose and manage the problem wholistically using clinical reasoning and logical thinking.

1. Generate plausible hypothesis and use appropriate strategies to reach an accurate diagnosis.
2. Synthesize and summarize the significant patient information and findings.
3. Interpret results of relevant clinical and laboratory investigations in the context of the patient problem.
4. Recognize the pattern of common illnesses, and identify pivotal and pathogenic signs and symptoms.
5. Use patient acceptable models — medical, social and psychological.
6. Formulate a plan of management for common clinical problems with assistance.

8. Diagnose and manage less common clinical problems under supervision.
9. Prepare concise, clinical summaries, to keep accurate and systematic patient records, and retrieve patients' information when required.

B. Use practical clinical patient contact skills, attitudes and behaviours, and make efficient use of available laboratory and other support facilities.

1. Elicit a medical history from a patient appropriate to his clinical complaint, condition or problem.
2. Perform relevant items of physical examination, as determined by the needs of the specific case.
3. Perform simple diagnostic and therapeutic procedures with assistance.
4. Request and interpret appropriate investigative procedures, given the needs of the patient, and the consideration of cost, potential benefits and patient risk.

C. Establish rapport and communicate with patients/relatives at a level appropriate to their understanding, education and beliefs.

D. Consult professional colleagues when in need of advice, and refer patients to colleagues as determined by the best interests of the patient.

2. Practice Preventive Medicine:

Incorporating community health, structure, attitudes, values, beliefs, practices and dynamics in his daily practice.

A. Identifies the structure of a community, fabric of society and the dynamics of its interactions, and the relationships within a family unit.

B. Correlates socio-economic factors with health and disease, and implements measures based on this to improve health.

C. Identifies risk factors in the community and implements measures based on this to improve community and individual health.

D. Communicates with, teaches, and leads the community in matters of their own health care.

E. Takes an active role in the evaluation of community health problems and needs, and in their solution.

F. Recognises his/her role in the community and the effects of his/her beliefs and values on interactions with and perceptions of individuals and the community.

3. Work as a member of the Health Team and along with other Health Practitioners:

A. Collaborates with other health professionals, and across the profession (intersectoral) in the development of community.

B. Work in the therapeutic teams and groups, as the leader or as a member of a mixed health team.

4. Participate in Research Programmes:

Especially in relation to national and community health problems.

A. Retrieves relevant scientific materials and assesses its utility and validity.

B. Evaluates scientific papers and journal articles.

C. Applies and uses simple statistical methods.

D. Designs simple experimental protocols, considering hypothesis, bias, error, etc.

E. Utilizes computers for storage and analysis of data.

F. Uses a filing mechanism for the efficient storage and retrieval of scientific data for future use.

5. Keep Himself Up-To-Date Through Continuous Learning:

A. Uses all available learning resources effectively.

B. Uses self-evaluation and peer evaluation and criticism, and recognises his/her own deficiencies and undertakes remedial learning.

C. Undertakes continuing education as a life long process.

6. Participate in Comprehensive Health Care Planning:

In individual practice and national health care delivery levels.

A. Identifies available community health care resources and welfare benefits that might be available to a patient.

B. Recognizes the pattern of funding and economics of health care in the Gulf States.

C. Plans and practices cost-effective health care and cost-containment at all levels.

D Plans his/her own future in clinical practice.

E. Conducts his/her practice in the Gulf States.

F. Manages his/her own health care resources and personnel.

G. Manages his/her own practice routines and procedures, and allocates time and priorities appropriately.

H. Manages the finances of the health care practice, stock control, budgeting, accounting and filing.

I. Makes use of business technology in the effective operation of health practice including the use of computers and other systems for filing, patient records, etc.

7. **Plans, Implements and Evaluates Education Programmes for the:**

A. Community, and

B. Inservice training.

Incorporating community health, structure, attitudes, values, beliefs, practices and dynamics in his daily practice.

APPENDIX II

Divisions	Areas Corresponding to Traditional Disciplines
Human Functions	— Internal Medicine
	— Pediatrics, Anesthesiology
	— Surgery, ObGyn
	— Opthalmology, ENT
	— Biochemistry
	— Pharmacology
	— Physiology
	— Immunology
	— Clinical Pathology
	— Nutrition
Human Structures	— Microbiology
	— Anatomy
	— Histology
	— Pathology
	— Radiology
Human Behaviour	— Family Medicine
	— Medical Biostatistics
	— Preventive Medicine
	— Epidemiology
	— Psychology
	— Clinical Psychology
	— Psychiatry
Medical Education	— Curriculum Development
	— Staff Development
	— Educational Resources
	— Evaluation
	— Student Counselling
	— Animal House

COST AWARENESS IN MEDICAL EDUCATION

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1. INTRODUCTION

Historically, the medical profession has kept itself aloof from matters not directly related to its work. The medical curriculum ensures that the future doctor is equipped only with knowledge directly pertaining to Medicine. The medical student is initially crammed with factual information on the biomedical sciences and then in later years of his training, absorbed in learning high-technology "ideal" medical care.

The rapid advances in the medical sciences has resulted in many investigative and treatment procedures which have raised the cost of health care. Many developed countries are concerned with the rising cost of health care without commensurate improvement in the health of those served. In developing countries, where the health budget is limited, economic efficiency in health care is of profound importance, especially if the aim is to provide care to the most number of people possible. The term "economic efficiency" means the provision of necessary care of good quality at minimal costs (1). The aim is to remove ineffective, excessive and unnecessary medical procedures. It is not to curtail the doctor's freedom in ordering investigative or treatment procedures.

One of the ways to promote economic efficiency is to encourage cost awareness amongst doctors, especially when the health service system they are practising in does not insist that either the doctor or the patient need worry about costs. Perhaps the time has come to consider whether the economic aspects of modern medicine deserve a little attention in medical education.

2. Survey

In an attempt to find out how aware of medical costs the young doctors are, and whether they feel that medical cost-consciousness should be introduced into the medical curriculum, a questionnaire survey was carried out in the University Hospital, Kuala Lumpur.

The aim of the survey was to find out, generally, whether the final year medical student or the young practising doctor has some ideas about the costs of investigations, common drugs used and hospital supplies related to treatment. Accurate or exact costs were not required in the survey. Their comments on whether cost-awareness had a place in the medical curriculum were also requested for.

3. RESULTS

A total of 214 questionnaires were sent out to final year students of the Faculty

of Medicine, University of Malaya, house-officers and medical officers in the University Hospital, Kuala Lumpur. Ninety-nine responded, the following categories were represented:

Designation	Number of respondents
Medical officers	42
House officers	8
Medical students	48
Unknown/not stated	1
Total	99

Of the doctors, 32 were graduates of the University of Malaya, 11 were from overseas universities, and 3 were from other local universities. Three respondents did not state where they graduated from. In general the breakdown of the respondents, including the medical students, by university is as follows:

University	Number of respondents
University of Malaya	82
Other local university	3
Overseas universities	11
Unknown/not stated	3
Total	99

Respondents were asked whether they had any idea of the cost of certain common drugs, investigations and other hospital supplies. If they indicated that they knew, they were further requested to give what they thought were the approximate costs. The percentages of responses which **suggested** awareness of costs of these items are given in Table 1 below.

TABLE 1

COST-AWARENESS OF SELECTED ITEMS

Item	Number of Answers Suggesting/Stating		
	Awareness	Wrong Estimates	"Don't Know"
Panadol	2 (2.02)	68 (68.69)	29 (29.29)
Ampicillin	3 (3.03)	37 (37.37)	59 (59.60)
Valium	1 (1.01)	23 (23.23)	75 (75.76)
Serum cholesterol	1 (1.01)	17 (17.17)	81 (81.82)
Liver function test	10 (10.10)	19 (19.19)	70 (70.71)
Full blood count	11 (11.11)	34 (34.34)	54 (54.55)
Chest X-ray	3 (3.03)	70 (70.71)	26 (26.26)
Barium meal	13 (13.13)	27 (27.27)	59 (59.60)

Liver scan	3 (3.03)	16 (16.16)	80 (80.81)
Blood culture	2 (2.02)	26 (26.26)	71 (71.72)
Surgical glove	6 (6.06)	31 (31.31)	62 (62.63)
Disposable syringe	12 (12.12)	35 (35.35)	52 (52.53)
100 ml Cetavlon	0 (0.00)	10 (10.10)	89 (89.90)
Hosp. electricity bill per month	2 (2.02)	7 (7.07)	90 (90.91)

(Numbers in parenthesis = percent of responses)

Regarding whether medical students should be exposed to medical costing and the costs of medical care during their undergraduate training, the following were the responses:

Response	Number of responses	Percent
Should be exposed	89	89.9
Should **not** be exposed	8	8.1
No response	2	2.0
Total	99	100.0

Of the respondents who wanted to include the subject into the medical curriculum, interesting comments included the following:

> "... It is thus important to know the cost so as not to inconvenience the patients (who are paying for the treatment) and to be selective in ordering investigations for maximum results."
>
> "... Educate the lecturers and consultants too, sometimes they order investigations indiscriminately ..."
>
> "... To save money and spend it appropriately. Lower work load to lab technician, and increase the efficiency of the technician and the instrument ..."
>
> "... as obvious from my replies I have no clue to costing and I feel the future graduates should not be so disadvantaged..."
>
> "... in trying to answer the questionnaire honestly I realised I did not know the true costs at all. I feel embarrassed. I admit I made some guesses ..."
>
> "... from the numerous negative answers you may gather that this doctor at least has no awareness of medical costing. I would be very grateful to be enlightened about the same ..."
>
> "... realised after going through these forms, how little I knew of costs of investigations that are ordered daily and routinely without a thought to costs. Medical costing ... I feel should be included in the undergraduate programme ..."

Of the respondents who felt that the subject of medical costing should not be included in the undergraduate medical curriculum, a number of the more interesting reasons supplied are as follows:

> "... doctor's duty is only to prescribe the best available drug regardless of cost ..."
>
> "... medical curriculum is already too full ..."
>
> "... not a doctor's responsibility but hospital administration's ..."

As to where the exposure to medical costing should occur in the undergraduate medical curriculum, some suggestions were offered by the respondents:

> "... cost should be brought up during ward rounds eg. students should be queried on the cost of investigation if they wished to order them ..."
>
> "... medical costing can be part of social and preventive medicine or added to the series of therapeutic lectures ..."
>
> "... lectures for year 4 and year 5 about medical costing "
>
> "... after presenting cases in ward rounds students should be asked to estimate the amount each patient has to pay for his/her stay in hospital ... in other words lecturers should be kept informed as to costs of all procedures, equipment and investigative tests ..."
>
> "... students while on posting outside of UH should be exposed to costs ... what may be routine X-rays or lab investigations may result in hospital bills that are heavy on the patient's meager rural income ..."
>
> "... a course on medical costing as part of in-house/part-time training for present house and medical officers ..."

4. CONCLUSION

à. Cost awareness should be introduced in the medical undergraduate education programme.

b. Paul Beeson (2, 3) suggests that the economic aspects of modern medicine deserves a better defined place in formal medical education and that it be taught by departments of public health and community medicine.

However, the writers feel that, in view of the already packed undergraduate programme currently existing, medical costing should be taught by clinicians by the bedside (as suggested by a number of the respondents) and that this be supplemented by some mention of medical costing during the course in pharmacology. The Department of Social and Preventive Medicine could bring in medical costing while teaching health or disease control programmes by mentioning the economic aspects of such programmes.

5. ACKNOWLEDGEMENTS

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OCCUPATIONAL AND ENVIRONMENTAL HEALTH PROGRAMME IN AN INTEGRATED MEDICAL CURRICULUM: AN APPROACH

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INTRODUCTION:

The School of Medical Sciences, Universiti Sains Malaysia, was launched on June 1979 as a third medical faculty in Malaysia. With an ambitious five-year undergraduate medical programme, the medical school has embarked on an innovative educational strategy based on an integrated curriculum aptly summarised by the SPICES model. By SPICES, the curriculum is:

S — Student-oriented
P — Problem-based
I — Integrated
C — Community-based
E — Electives
S — Systematic & Self-Learning

The five-year undergraduate medical curriculum is planned according to three phases (Phase I, II & III) based on the 'spiral' concept: knowledge gained in the first spiral (Phase I) to be enlarged upon in the second (Phase II) and hence, third (Phase III) spiral. Phase I is the basic foundation of medical sciences, Phase II focuses on the problem-based/organ-system approach while Phase III concentrates on the skills of problem-solving and clinical clerkship. The curriculum is designed to enable both vertical (i.e. between disciplines) and horizontal (i.e. between blocks) integration to take place concurrently.

An important component of the School's programme is a programme called the Community and Family Case Studies (or CFCS). Originally designed as the Family Case Studies (or FCS) Programme, the CFCS programme has since expanded on the scope and coverage of health issues related to the family and community based on three basic premises: [2]

"1. The students need to apply theoretical knowledge in order to synthesize what they learn;

2. The process of active learning is incorporated into family and community life studies and provides accurate perspectives of people and situations; and

3. The linkages between socio-cultural, political and economic factors and illness, are brought into realistic focus, when working in the homes of people and the community at large."

The CFCS Programme is integrated into the curriculum throughout the five years of undergraduate medical education. It is planned as a learning experience. It serves to supplement what is taught in the classroom, clinics and hospitals through supervised exposure to actual situations in the community.

Through the CFCS programme students are expected to sharpen and enhance their skills in communicating and relating to people and be able to become increasingly confident in their simulated roles as doctors. Their professional competency is increased as they advance through the different phases of the programme.

The students are expected to identify, assess and deal appropriately with the health-related problems of families and the community. Health education activities are also undertaken to provide guidance to families and the community concerned.

Educational activities of the CFCS programme are divided into packages spread over the entire duration of the M.D. Curriculum. In Phase I (Year I), students are expected to acquire preparatory knowledge of CFCS through didactic instructions of basic areas : basic medical sciences, behavioural sciences, epidemiology and biostatistics, and attitude and ethics. In Phase II (Year 2 & 3), activities are divided as follows: in Year 2, students are introduced to four packages in sequence: community profile, health resources, nutrition and infection, and health education; whilst in Year 3, the sequential packages are: maternal and child health, school health, occupational and environmental health, and geriatric and private health care. Phase III is devoted to follow-up of patients in the homes, family and community (Year 4) as well as selected patients from clinical postings (Year 5); the culmination of the programme takes the form of case presentations and seminars.

This paper is devoted to the occupational and environmental health package which occupies ten weeks of CFCS in Phase II (year 3). Further discussion will examine the implementation strategy adopted, mode of assessment, problems encountered and recommendations proposed.

OBJECTIVES

Specific objectives are derived from the general objectives of the CFCS programme handbook.

For purposes of clarity, the objectives are divided into two distinct components: Occupational Health and Environmental Health.

The Occupational Health component deals with the principles of occupational health and safety, common occupational hazards and diseases in Malaysia, causative agents/factors, mechanisms of structural and functional changes, layout and work processes of selected industries and possible hazards, interventive measures, health education, and roles and responsibilities of doctors, community, public and private agencies concerned with occupational health and safety.

The Environmental Health component covers the following: potential hazards associated with unsanitary water supply, refuse disposal, sewage disposal, inadequate housing and natural disasters (such as the seasonal flood); treatment processes of water, refuse and sewage, air, water and noise pollution, radiation and environmental toxins and the environmental health programme as well as public and private agencies concerned with environmental health.

CONTENT

The course content is derived from the specific objectives and divided into the occupational health component and environmental health component.

Occupational Health component covers the following : principles of occupational health and safety; common occupational hazards and diseases; occupational cancers; and interventive measures which include public and private occupational health agencies, legislation with particular reference to the Factories and Machinery Act (1967) and health education.

Environmental Health component deals with the following : principles of environmental health; common environmental hazards and diseases; treatment processes of water, refuse and sewage; environmental pollution and toxicology; and environmental health programme which include public and private agencies, legislation (eg. Environmental Quality Act 1974) and health education.

MODE OF IMPLEMENTATION

An innovative feature of this package is the prominence given to STUDENT-ORIENTED LEARNING, which is consonant with the first letter 'S' of SPICES.

Approximately less than 30% of total contact hours is taken up by teacher-centred activity (namely lectures & staff seminar). The remaining 70% is basically student-centred. Problem-based learning occupies approximately 15% of total contact hours whilst field activities (field visit and family visit) occupy another approximately 21% of total contact hours.

The lectures are basically a didactic form of instruction; the staff seminars utilize experts from the various agencies involved whilst the student seminars are in the form of structured student presentations of pre-selected, well defined and organised topics of major interests to occupational and environmental health in Malaysia.

The problem-based learning takes the form of small group discussions where students and tutors (facilitator role) discuss problems (triggers) as a means to understanding basic underlying principles of occupational and environmental health.

Videos and tape-slide programmes are useful adjuncts to the learning process as they provide the necessary visual stimulus to the further understanding of the subject area.

Structured self-study are sessions whereby students review relevant materials (lecture notes, reference texts, etc.) in order to consolidate what has been learned in the classroom.

Field visits as well as visits to selected families give students the much needed perspectives of occupational and environmental hazards and diseases because they are able to experience and use the concepts learned in the classrooms. After the field visits, reports are compiled and submitted; a class presentation by each group of students (6 groups altogether) enables the sharing of experiences and information by all students.

MODE OF ASSESSMENT

Assessment takes the form of a written component (MCQ & MEQ), field visits (report and presentation) and student seminars. 80% is devoted to the written component whilst 10% each is allocated to the field visit and seminar respectively.

It should be noted that the written component does not merely assess didactic information but include information from the various instruments of instructions utilized (PBL, staff seminar, student seminar, video, tape slide, field visits and presentations).

PROBLEMS ENCOUNTERED & RECOMMENDATIONS

As in any programme, shortage of personnel continues to be a problem despite the fact that in an integrated curriculum a multidisciplinary approach, as distinct from the unidisciplinary approach of "traditional" curricula, is adopted. However, with the planned transfer of staff from Penang Campus to the Kubang Kerian Campus in Kelantan, this problem will hopefully be alleviated. As a long term strategy there is a need to increase the number of public health personnel (Public health doctors, inspectors, nurses and technicians) as well as upgrade and maintain in-service training of these personnel so that the programme can be improved as time goes by.

Although a multidisciplinary utility of support services, in particular laboratory services, is ideal, it is imperative that some thought be given to the inclusion of occupational and environmental health aspects. A separate occupational and environmental health laboratory will be excellent support for the programme as well as for the Medical School. With such services available, the programme can be improved a great deal and the laboratory aspects can be more meaningfully integrated into the existing educational package.

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PERFORMANCE APPRAISAL OF THE MANAGEMENT TEAM IN THE OFFICE OF THE DEAN

THE EXPERIENCE OF THE FACULTY OF MEDICINE, UNIVERSITY OF MALAYA

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1. INTRODUCTION

A Faculty of Medicine can be viewed, in "private sector" terminology, as a "corporation" which has as its objective the production of safe, well-trained and effective general doctors suitable for employment in any part of the country. This the Faculty attempts to achieve by its undergraduate medical education programme.

The Faculty consists of many sectors — the academic departments, the support service units, the University Hospital and the attached administrative elements. All these sectors contribute towards the "corporate objective" of the production of this general doctor outlined above.

In order to co-ordinate the activities of the various sectors listed above, and to provide leadership and direction to the Faculty for the consolidation and further development of its facilities and educational programmes, a "management team" is appointed in the Office of the Dean. This team, in the context of the Faculty of Medicine, University of Malaya, consists of the Dean of Medicine, his Deputy Deans and the Assistant Registrars. Other medical faculties will probably have similar arrangements.

In the context of the Faculty of Medicine, University of Malaya, the Dean and his Deputies are appointed by the Vice-Chancellor of the University for a two-year term. The faculty members (ie. confirmed academic staff members) have very little or no influence in this matter. Thus, the Dean and his Deputies (ie. the main components of the management team) assume office with, technically, little idea of the extent of support they will receive from the Faculty. In the execution of their duties, there is little formal feedback from the "grass roots" of the Faculty as to how the "team" is performing. Apart from opinion expressed by the Heads of academic departments at various committee meetings, most feedback are via rumours and through the Faculty "grapewine".

This state of affairs, it was felt by the "management team" of the Faculty of Medicine, University of Malaya, which took office in May 1985, not to be satisfactory as one of the team's management objectives was to introduce new management methods into the Faculty. With this in mind, the team conducted a "performance appraisal exercise" on itself by seeking formal

feedback from all faculty members via questionnaires which required anonymous responses.

This paper seeks to present a concept of the evaluation of the top management in a Faculty of Medicine, to describe one such evaluation exercise, and to discuss the value of such a concept and exercise in the local context.

2. PERFORMANCE APPRAISAL EXERCISE

2.1 Objectives

The general objective of the exercise was to obtain feedback from faculty members concerning the team's ability to do its job with the ultimate aim of either proceeding for the rest of its term of office in an "as is" condition, to improve itself where necessary or to quit being the management team if it did not receive support for its management objectives or its style of management.

Specifically, the exercise focussed on five areas on which the team would like some feedback:

- whether faculty members agreed with the management objectives of the team and thus the direction the team is taking in its work,
- whether faculty members agreed with the management style adopted by the team,
- whether faculty members thought the team should continue,
- on a scale of 0 (zero) to 4, how would the individual respondent score the overall performance of the team, and
- whether this system of performance appraisal should continue and if so, at what intervals?

2.2 Methodology

The exercise was carried out by means of an "appraisal instrument" which consisted of two parts. The first part was an explanatory note (as this is the first time such an exercise was conducted) which described the management objectives and style adopted by the management team, listed some progress made or not achieved by the team, and the objectives of the exercise. The second part consisted of questions to which responses were solicited. These questions related to the five areas of concern listed in the objectives (2.1 above). Spaces for elaboration or further comment were also included in the questionnaire (However, these will not be considered in this paper due to its length).

The appraisal instruments were sent out to all faculty members on 21 December 1985 and replies were requested by 31 December 1985. An extension was allowed and all replies by 14 January 1986 were accepted.

A total of 114 faculty members who were not on sabbatical leave or members of the management team were "available" as respondents to this exercise. It was not possible to obtain the number of "available" respondents who were on vacation leave during the period of the exercise.

The team set certain criteria which it considered as "satisfactory" at this point and these will be used to compare with the responses obtained in each of the areas of concern.

2.3 **Results**

a. Response:

Out of a total of 114 "available" respondents, 44 replies were received giving a response rate of 38.6%.

One reply was blank, whilst the rest did not reply to all the questions listed.

b. Agreement with management objectives?

A total of 43 responses were received regarding whether responding faculty members agreed with the management objectivers of the team.

Thirty-nine (90.7%) of the responses said "YES" whilst 4 (9.3%) answered "PARTLY". None answered "NO".

c. Agreement with management style?

A total of 43 responses were received to the query regarding whether faculty members agreed with the management style of the team.

Thirty-three (76.7%) of the responses said "YES", whilst 9 (21.0%) answered "PARTLY" and 1 responded "NO" (2.3%).

d. Should the management team continue?

A total of 43 responses were received to this query.

Forty (93.0%) responded with "YES" whilst 3 (7.0%) replied "CONDITIONAL" and none said "NO".

e. Overall performance score:

The tally for the overall performance score where a 0 (zero) denoted "poor" and a score of 4 indicated "very good was as follows:

Score	**No. of responses**
0.0	0
0.5	0
1.0	1
1.5	2
2.0	6
2.5	5
3.0	19
3.5	5
4.0	2
Total	40

From the above, the mean score was calculated to be 2.78. The modal and median scores were 3.0.

f. Whether appraisal exercise to continue?

To this query, a total of 42 responses were received. Of these, 37 (88.1%) answered "YES", 5 (11.9%) replied "CONDITIONAL" whilst none said "NO".

A supplementary question asked for the interval at which these exercises should be conducted. The following were the responses:

6 monthly	15 (35.7%)
12 monthly	24 (57.1%)
24 monthly	3 (7.1%)
Total	42 (99.9%)

g. Comparison of set criteria to results obtained:

The team set certain criteria as marks of satisfactory performance. These are given below and are compared with the results obtained:

Index	**Set Criteria**	**Result Obtained**
Response rate	At least 30% response	38.6%
Agreement with management objectives	70% or more say YES*	90.7%
Agreement with management style	70% or more say YES	76.7%
Should the team continue	70% or more say YES	93.0%
Overall score	2.50	2.78
Appraisal exercise to continue	70% or more say YES	88.1%

* indicates % of respondents

3. DISCUSSION

3.1 Concept

The concept of evaluating of appraising a group of persons, a process or a programme to determine the performance of that group, process, or programme is a well-known one in education. This is particularly so in the appraisal of student performance as well as that of teacher performance. In the medical and health field, the evaluation of programmes executed for the preservation or promotion of the public health is already an essential part of health planning. In the latter case, a superimposed concept of accountability for public funds expended by the health programme planners and implementors is called into focus.

Similarly, it is felt that the appointed management team of a Faculty of Medicine should be accountable not only to the authorities who made the appointment but also to the Faculty itself. In this direction, all faculty members should have a formal channel via which it can comment, without fear of intimidation, on the performance of the management team. This feed-

back channel should also allow the management team to improve itself in its relationship with the faculty members and foster a stronger "corporate image and identity".

Of the many ways by which management performance appraisal can be conducted, it is felt that the method described in this paper is the simplest and least expensive. The results of the exercise described seems to show that the simple appraisal instrument can elicit the type of responses required and can can be quite "sensitive" (see para 3.2c).

3.2 **Results of appraisal exercise**

a. Response rate

The response rate of 38.6% does not seem satisfactory although the minimum response rate expected by the team was 30%. It was felt that usually, the response rate to this method of investigation will not be high. The team decided that unless the response matches its set criteria, it will consider the exercise as a total failure.

There may be a number of reasons for this rather low response rate. One was that during the period of the exercise, many of the faculty members were on vacation leave. Another could be that the exercise was not taken seriously by some who felt that it was some kind of gimmick. (Some comments given in the responses could be considered as flippant).

b. Continuance of the exercise:

Of the 42 responses received to this aspect of the exercise, it may be noted that none answered in the negative. This seems to show that all the respondents would like such an exercise to continue, although 5 (11.9%) would like to see some change in the interval between exercises.

c. Comparison of set criteria to results obtained:

It is interesting to note that whilst 93.0% of the respondents would like the team to continue and 90.7% agreed with its management objectives, only 76.7% agreed with its management style.

Although the team professed to using an "open" style of management, some of the respondents felt that the communication between the team and the bulk of the faculty members was still not good enough. Some felt that there was too much of "flamboyance" and certain systems instituted were "eye-wash".

It was felt that although the appraisal instrument was a simple questionnaire, it had been "sensitive" enough to obtain the kind of information (as above) as feedback to the team.

3.3 **Value**

The management team felt that the value of the appraisal exercise is two-fold. It has given the team information on what has been done "right" or "wrong" in the eyes of the faculty members to whom it is accountable. More importantly, it is felt that the exercise has also given the faculty members an opportunity to "say their piece" in a system which does not allow them any participation in the process of appointing the top management team of their own Faculty.

4. CONCLUSION

Inspite of the low response rate to this first performance appraisal exercise conducted by the management team in the Office of the Dean of Medicine, the team is of the opinion that the exercise is of sufficient value to both the team itself and to the faculty members.

It is intended that this exercise will be conducted again by the new management team appointed in April 1986 at the end of twelve months as suggested by the respondents to the exercise.

EVOLUTIONARY TRENDS IN UNDERGRADUATE ORTHOPAEDIC EDUCATION IN THE UNIVERSITY OF MALAYA

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INTRODUCTION

Orthopaedic surgery is an essential part of the undergraduate curriculum. In England, the United States of America and Japan there has been an evolution towards greater emphasis on orthopaedic education rather than training with the shorter but more intense exposure to the discipline. The Faculty of Medicine, University of Malaya is at the intermediate stage.

Since the majority of the undergraduates will become General Practitioners, the proposed new curriculum with emphasis on Primary Medical Care, trauma as well as accident and emergency exposure is timely. In the future with further developments of our health services and the provision of all the specialised services, there will be a further need to modify the orthopaedic curriculum towards the limited exposure existing presently in the developed countries. For the present there is a need for good primary medical and emergency care both in the rural and urban set up. Hence the new curriculum is proposed.

The Goodenough Committee (1944) recognised the importance of orthopaedics in the clinical curriculum and few would argue that orthopaedics should not be taught in the undergraduate. About 10% of our outpatient and Accident work consist of seeing to musculo-skeletal disorders and this applies to General Practice as well.

Accident & Emergency Attendances/Admissions:.

November 1985 to April 1986

Total A/E Attendances	:	28,646
Orthopaedic Surgery Attendances	:	3,613 (12.6%)
Total admission to all units	:	5,294
Admission to Orthopaedic Surgery Unit	:	554 (10.5%)

Outpatient Attendances — November 1985 to April 1986

Total Outpatient Attendances	:	114,505
General Medicine	:	16,873
General Surgery	:	11,442
Orthopaedic Surgery	:	11,803 (10.3%)

For 70% of medical graduates the only orthopaedic training they receive is during the clinical part of the undergraduate course (Wright et al 1979).

The problem in medical education is with the hospital specialities such as orthopaedics in that the student should be taught what is basic and of general use and not become embryo specialists (Simpson 1972;. More than 70% of our students will become general practitioners. This makes more relevant the increasing emphasis on primary care.

How do we ensure an adequate exposure to orthopaedic surgery and trauma? In the University of Malaya in 1964 the following was the curriculum for orthopaedic surgery : Anatomy, Physiology and Pathology of the musculo-skeletal system was taught in the 1st two years of the basic medical sciences. This was followed by clinical exposure in the next three years. An introductory period of lectures and bedside tutorials in the 3rd year followed by clinical clerkships of five and seven weeks in the 4th and 5th years.

Present Curriculum — Orthopaedic

1st Year	:	Basic Science — Normal
2nd Year	:	Basic Science — Abnormal
3rd Year	:	Clinical — Introduction to Patient Care
4th Year	:	4 Week Clinical Posting
5th Year	:	5 Week Clinical Posting
Other Postings		District Hospital

The main bulk consisted of bedside tutorials and demonstrations of elective orthopaedics, trauma and rehabilitation. The total care concept is introduced and taught in the 4th and 5th years. During the 5th (final) year clinical clerkship, there is exposure to Accident & Emergency training with tutorials in the Accident Department. Is this enough today?

Curriculum Development

Over the last 15 years, curricula of medical schools through out the world have been studied and changed. There are new medical schools with integrated curriculum catering for special needs or for the changing pattern of disease and the changing society as well.

In Japan since 1970 there have been 30 new medical schools, some with specialised integrated curriculum, to cater for special needs in either an urban or rural setting.

In Kitasato University Medical School (Private 1970) generalised courses are according to organ systems which are followed by clinical clerkship.

In Jichi Medical College Faculty members are divided into organ systems and cooperate to conduct an integrated curriculum which consist of two phases of three years each:

1st Phase	:	Basic Medical Science General Clinical Medicine Integrated Lectures.

2nd Phase: Bedside Teaching
Further Clinical Courses.

Students are geared to work in a rural set-up.

In the Nuffield Orthopaedic Centre, Oxford, England, there are separate teaching programmes for elective orthopaedic surgery and for the Accident Service (Tables I and II).

Table I: THE OXFORD ACCIDENT SERVICE UNDERGRADUATE TEACHING PROGRAMME

Contents	Time (Hours)
Introduction	1
Anatomy Revision	4
Practical Instruction	19
Clinicoradiological Conferences	10
Bedside Teaching	12
Operating Theatre	6
Seminars/Tutorials	26
Case Presentations	3
Clinical Study Periods	7
Assessment/Feedback	3
Out-Patient Clinic	12
	103
OPTIONAL	
Ambulance Attachment	6

Table II: THE OXFORD ORTHOPAEDIC UNDERGRADUATE TEACHING PROGRAMME

Content	Time (Hours)
Introduction	1
Bedside Teaching	34
Seminars	16
Tutorials	14
Operating Theatre	10
Out-Patient Clinic	9
Audiovisual Teaching	5
Case Presentation	4
Clinical Study Periods	33½
Assessment	2½
Comments/Feedback	1
Total	130

Orthopaedic teaching occupies only 4 weeks (3%) with bedside teaching, seminars and tutorials occupying the bulk of the programme. In the Accident Services, undergraduate teaching occupies 4 weeks (3%) wuth small groups of seven students. Here again bedside teaching, tutorials/seminars with some practical instruction form the bulk of the programme.

How do we integrate orthopaedic surgery and what are our special needs?

It is difficult to implement integrated curriculum in established department based Medical Schools. However, we have to develop as well. In the process we have to be aware of the special needs in Malaysia, particularly that of the doctor who will be practising in small towns or rural areas.

Changes in pattern of disease

a) There is a decrease in communicable disease and an increase in degenerative disease.

b) Disease in hospital practice are quite different (tumours and congenital anomalies).

c) Accidents at home, work and on the road remain important but are preventable.

There is a need for good primary care and emergency care in every community. We should respond to this need in the setting up of our own undergraduate curriculum. We need to state the new objectives and the role of orthopaedic surgery in a new curriculum. The following are the objectives with the proposed new orthopaedic curriculum:

Objectives

1) To convey to the student a knowledge and understanding of the neuromuscular system in proportion to its importance in medicine and to the extent necessary for the student to develop a balanced concept of the human body and its disorders.

2) To delineate the normal and abnormal neuromuscular system and to teach the basic principles of diagnosis and treatment.

3) To convey facts regarding the more common conditions encountered in orthopaedic surgery and at all times to cultivate the scientific approach in the student.

4) To teach the cardinal principles of the treatment of trauma and fractures with a more detailed understanding of the treatment of certain simple fractures to illustrate the general tenets.

5) To present to the student the total picture of physical disability, chronic disease and rehabilitation.

6) To develop in the student the curiosity and respect for the problems in this field.

New Curriculum

1st Stage	:	Anatomy correlation
2nd Stage	:	Introduction to Patient Care
3rd Stage	:	Nil or 4 weeks Trauma
4th Stage	:	8 weeks Orthopaedics
		2 weeks A/E (Accident & Emergency)
		Primary Medical Care 4 weeks.

Conclusion:

1) Orthopaedic Surgery is an integral and essential part of the undergraduate curriculum.

2) The concept of training and educating 'safe' doctors will need to be maintained. The effective orthopaedic exposure will be increased with the postings in primary medical care and the accident and emergency unit.

3) Integration with the relevant departments e.g. Anatomy, Pathology, in 1st and 2nd stages and the clinical departments of Radiology and Medicine in the 3rd and 4th stages will make it more meaningful. There will be continuous exposure to orthopaedic surgery throughout the four stages. Increased emphasis should be placed on bedside teaching and tutorials/ seminars to small groups.

4) Since more than 78% of the undergraduates will become general practitioners, the introduction of the primary medical care department and the separate accident and emergency posting is timely and of vital importance.

5) There has to be evolution of the medical curriculum to keep pace with changing needs and development of the Malaysian environment.

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PANEL DISCUSSION

TODAY'S PHYSICIAN, YESTERDAY'S EXPERIENCE

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Introduction

Sixty four (64) students of Universiti Sains Malaysia commenced a new integrated medical course in 1981. 5 years have gone by with 50 of us graduating in July 1986. We have gone through these years experiencing both the good and bad. In this presentation, we will highlight these experiences and certain points which may be of interest to medical educationists.

Objectives and Philosophy

The philosophy of the School of Medical Sciences is to produce doctors who are equipped with a spectrum of medical knowledge that enables them to solve medical problems at a community or individual level. The school has set out the following objectives:

A) Understand the scientific basis of medicine and its application to patient care;

B) Acquire a satisfactory standard of clinical competence relating to the following parameters:

   i) able to interview and obtain a satisfactory case history;

   ii) perform physical examination and carry out simple clinical procedures;

   iii) able to diagnose common diseases and acute emergencies and formulate their solutions, which entail the institution of first line management before referral for specialist treatment wherever necessary;

   iv) acquire satisfactory behavioural and communicative skills necessary for instituting patient management;

   v) Understand and appreciate the socio-cultural background of the patient and his environment in formulating a plan of management, including long term management and follow-up;

   vi) Understand the broader role and responsibilities of medicine in society and play the role of leader in the health care team and the community;

   vii) Utilise the knowledge acquired to pursue continuing Medical Education.

***Final year.**

Curriculum Implementation Evaluation

The medical curriculum in Universiti Sains Malaysia is an integrated, problem-based and community-oriented system. It can be summed up in one word : 'SPICES'.

S — Student centred.
P — Problem solving.
I — Integrated
C — Community oriented.
E — Electives
S — System approach.

PROBLEMS IN IMPLEMENTATION

1. Teaching Staff

The Integrated System is a new system. However, most of the teaching staff are more familiar with the traditional system. In the implementation of this system, we found that the lecturers and tutors were not well-versed with this system which may have been due to ineffective orientation and training of staff or on the other hand reluctance to change.

Disciplines

We found anatomy, physiology and pharmacology deficient in their content and we suggest additional relevant facts on these topics.

PBL (Problem-based Learning)

PBL is an interesting mode of learning from discussion with peers but we encountered problems due to lack of participation of students. This is due to lack of preparation, loss of interest and shyness.

We found PBL helpful in improving our problem solving approach. In the preparation of PBL, the time allocated was adequate. We prefered a moderator who is well versed in the relevant topics because many inexperienced tutors could not guide us correctly. We had a group of 6 — 8 students for discussion which was satisfactory.

Handouts were found to be very essential to facilitate the discussion. We were 'spoonfed' to a certain degree by the lecturers during PBL. This made us less self-centered and more dependant on lecturers.

FLMS (Fixed Learning Module)

The system of fixed learning modules was found to be very unsatisfactory in its mode of presentation. The content was more than sufficient but methods of presentation were poor, causing students to lose interest. The teaching venue was unsuitable due to its lack of good ventilation. The FLM would have been beneficial if a more organized and conducive environment was available.

CLINICAL METHODS:

Bedside teaching — we would have preferred more sessions and more case discussion in smaller groups because it would have helped us improve our understanding of the basic sciences. We had the opportunity to be active in the wards and using certain basic ward procedures such as setting un an intravenous drip, venepuncture etc. Students lab. are very beneficial in relation to ward activities because we can correlate our investigative procedures with our clinical findings.

Tutorials are beneficial to students because students took an active part in presenting and answering questions, and helps in refreshing our knowledge. We found specialist clinics to be beneficial but it could be improved by reducing the number of students in each clinic and to allow all the students to be present when each of them present their case.

First Aid

Majority of the students found First Aid exciting and enjoyable. The students have to practice on their friends and themselves. Thus the interaction made the practices more enjoyable. A few students think that more emphasis should have been made on pharmacology and anatomy rather than First Aid, but most felt it was beneficial.

Nursing

This course was not viewed as being important academically. The lectures given were taken seriously by the students but they felt that the practicals were not interesting. On the whole, students felt that the experience gave them an insight into the responsibilities, services and problems faced by the nurses. It also gave an overall idea to the students on how to avoid misunderstanding and improve working relationships between nurses and doctors.

Assessment

In Phase I we preferred weekly assessments because it helps us to assess our own performance thus enabling self-improvement within a short time span. We had enough time for revision before any weekly assessment, block exams or professional exams.

MEQs are unsatisfactory because:

i) Construction of questions was not well done.

ii) Expected answers are not limited.

iii) Some questions are not specific.

iv) Sometimes very confusing.

MEQ did not tests the students' knowledge in depth. MEQ did not improve our problem orientated approach but rather made us aware that to answer MEQ we had to be more problem-orientated. The time allocated for MEQ was insufficient because certain questions which a student knew more about would have taken more of his time in answering than those he knew less. The answers to the MEQ

were very flexible, this made the students insecure about answering and induced students to write more for a limited amount of time. We prefer MEQ to essays because MEQs are not limited to one topic and requires thinking more than regurgitation of facts learnt.

MCQ

No specific problems other than the tendency for students to misjudge the intent of questions. Students were trying to correlate a certain response to other possibilities whereas the response required only a straight forward relationship with the stem of the question.

OSCE

OSCE were favoured more by students because everyone had to answer the same questions. We did not have to undergo the anxiety of facing an examiner as compared to facing a station. It did test our knowledge in certain clinical aspect but it could be improved by not putting too many subquestions in the station for the limited time given. OSCE must be well organized and people involved must be well informed on how to manage their individual stations (reference to staff nurses, medical officers and others).

Clinical Examination

During the long case presentation, it was generally felt among us that the examiners did not use the checklist provided. This may be due to the fact that it was not used in the presence of the students or not used at all.

It was felt that if the checklist was not used when they were presenting, omissions might be made by examiners. This problem was noted to be rampant during the block examinations and not during the Professional Exam.

CFCS

The CFCS was considered a good programme in preparing us to be better doctors. 91.3% of students responded in this manner. The others thought that there was an inbalance between knowledge gained and time consumed. Another opinion was that there should have been more focus on the community's problems rather than one family. Case selection was a difficulty faced by the students. 30.4% encountered this generally and suggested that interesting cases for follow-up should be selected by Consultants/Supervisors. Half of the students used public transport to visit their families. This mode of transport was a problem because 28.3% said that a lot of time was wasted waiting for the bus and they also had to use their own money. Organizing home visits with the school's transport was the main suggestion. There wasn't any difficulty in communication with the families except on sensitive issues and this was encountered by 4.3%. Only 10.0% felt that their families were not open to discuss their problems. On the whole, the CFCS programme was a program that started out with the students not knowing what exactly to do, but eventually turned out to be enjoyable and had a lot of interesting incidences.

Electives

It can be said that every student love electives; it is the time to gain more knowledge and experience new situations, at the same time put our minds at ease in between exams.

The time allocated for electives were appropriate although we faced certain problems such as·

1) Inability to get the services of a supervisor.
2) Problem of sponsorship.
3) Limited choice of topics of interest.

The elective report has benefited us and PPSP by determining which elective is suitable for future students, and which supervisor is prepared to accept future students. Some of the interesting topics should be repeated because it is interesting regardless of the intentions of the students going for it. Some of them may even follow-up their electives to their postgraduate levels. Some do not think this is a link to their future. Some of the problems that make the electives not enjoyable were:

1) Wrong choice.
2) Uninterested supervisors.
3) Poor organization.

Experience gained were significant to our learning because it makes us appreciate the uniqueness of electives and makes us think more creatively and imaginatively. We also acquire certain skills for our future undertaking.

How the student studies?

There are numerous answers to this question. We are not worried about the methods used by the students, and whether any of the methods have an integrated approach or not. During the first phase, all of the students studied with respect to the various disciplines being taught. If it was histology for a week, the whole week will then be concentrated on histology. During the second phase, integration was carried out but as the emphasis weakened, students did not feel secure with the integrated approach, they reverted back to their traditional method. Eventually in the minds of the students, integrated approach is the way that they should study but in practice only a small percent of their studies were carried out in that manner.

The third phase was the time when the students realised that they had to be more integrated in their efforts to study. This helped them to understand disease process and case management. It was also essential because they have to face an integrated examination.

Students

We found students had difficulties initially in carrying out the programme because they were not self-reliant, self-dependent and mature enough to

undertake these responsibilities. This problem arose because our primary and secondary education is not geared for the students to acquire the above qualities

Lack of proficiency in English was another obstacle in the successful implementation of this system.

Lecturers

The following problems were encountered with some lecturers:

i) Lecturers did not fully understand the integrated system.

ii) The high turn-over rate of the lecturers in the medical school, contributed to the slow progress of implementation.

iii) Lecturers were from different parts of the world with different undergraduate training, attitudes and difficulties in adjusting to this new system.

iv) Lecturers were not motivated enough in the implementation of the system.

Achievements/Suggestions

The question of concern now is 'Have we achieved the objectives and particularly the success of SPICES in our Medical Education?

If we look back at the objectives, we feel that we have not fulfilled the first objective fully. On the other hand, the other four objectives have been met.

This was achieved inspite of the shortcomings related to problems of logistics, staff strength, financial etc. associated with a new and growing Medical School.

We suggest:

1) all the staff to be effectively orientated in the new system and disassociate themselves from the traditional system;

2) students should be well orientated in the integrated system;

3) logistic problems such as financial and staff recruitment should have been solved before the intake of the 1st batch;

4) FLM, PBL, clinical sessions, tutorials etc. should be improved and made more effective.

Tutorials

1) Topics should be covered by the appropriate Consultants in a lecture for all the students and will later be dealt by the students in the particular block as a tutorial.

ASSESSMENT

MEQ

1. MEQ should be well constructed with a smooth flow of interconnected questions.

2. Limit the answer by asking the students to give the specific number of responses which are of priority.
3. Questions be more specific.
4. Clear cut questions should be given so as not to confuse the students.

FLM

1. Clear, concise and organized presentation in forms of posters, slides and modules that interact with the students.
2. Conducted in a place suitable for students, a place where students would like to stay for hours without being sweaty, tired and thoroughly miserable.

PBL

1. Participation by students can be improved by identifying weak shy students and involving them in extra activities that improve their skills in presentation.
2. Students must be well prepared. This must be on their own initiative.

Bedside Teaching

1. More sessions and more case discussions with appropriate consultants.
2. Increase patient variety.
3. Number of students to one tutor and each session should be reduced to a maximum of 6.

MEQ

Time allocated for each question should be reinforced in the students'minds so that the stipulated time would not be exceeded. During the exam, the invigilators can play a role of a time marker by indicating to the students that they should have completed a certain question in a required time.

OSCE

1. Limit the number of subquestions per station and try to ascertain the time required for a student to finish one question.
2. Organization of OSCE must be in order of sequence.

Clinical Examination

1. Checklist should always be used for all clinical assessment whether it is in block or Professional Exams.

Electives

1. Medical School, Universiti Sains Malaysia should contact other Medical Schools so that they can identify those who are willing to supervise students in electives.

2. A Foundation should be initiated to help students pursue electives overseas or within the country.

Students

1. Students should be more proficient in English or lecturers should be more proficient in Bahasa Malaysia. This can be done by insisting each of them taking extra classes in the languages concerned.
2. Students selected for Medical School should have an aptitude test and screened for the features of self dependency, abilities to undertake responsibilities and also maturity in their thinking.

Lecturers

1) Lecturers should be well versed with the new system before teaching the students.

2) Programmes to improve lecturers' self-motivation.

3) Selection of lecturers should be based on interest and appreciation of the new integrated system rather than academic.

Conclusions

Generally, the main impression gathered throughout these 5 years was that a new system was implemented to a group of students and lecturers who were unsuitable for successful implementation of the system. The system itself is very practical, very adequate in achieving the school objectives and progressive in changing the way of thinking of the students and lecturers.

The problem really lies in the atitude, self motivation and maturity of students prior to entrance to Medical School and also the lecturers who were and still are not well versed with the integrated system, refusal to accept changes, disillusioned, dogmatic and didactic with the system. The other problems mentioned in the text can easily be dealt with. Lastly and contrary to the above, due to the efforts of the students with the help of the consultants, we have come to a compromise where extra effort was put in the 4th and 5th year so as to produce doctors that have been able to fulfill the objectives of the School.

Despite being a new Medical School with a new Curriculum and associated problems attached to it, we can proudly say that the Curriculum has been able to produce doctor's suitable to the needs of the country. It has been heartening to know that our integrated system has improved since. We like to end our paper with the statement that "Integrated system is here to stay in USM"!!!

DEVELOPING POSITIVE ATTITUDES TOWARD MEDICAL PRACTICE

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In the past few years new developments are taking place in the medical schools around the world in the training of doctors in new approaches to medical practice. One of the important changes is the realisation that it is essential to introduce training in attitudinal awareness among medical students.

WHAT IS AN ATTITUDE?

Mednick, et al[1] hold the view that 'an attitude is a predisposition to act in a certain way towards some aspect of one's environment, including other people'.

Triandis[6] views it as 'An idea, charged with emotion, which predisposes a class of actions to a particular class of social situations'.

Rokeach[1] adds an additional element in the definition, and points out that an attitude is 'a learned orientation or disposition'.

There are three major components of attitude:

1. A **cognitive** component — beliefs and ideas
2. An **affective** component — the emotion which charges the idea.
   This constitutes the **values**, and
3. A **behavioural** component — a predisposition to action.

In the personal development of medical students and doctors the emotional factor of the attitude is important. The doctor must recognize the emotional state of the patient, and react or interact accordingly. At the same time, the doctor must gain insight into his own emotions and values. [4]

HOW ATTITUDES DEVELOP?

Attitudes are learned — there is no dispute about it. Puthucheary[6] points out that attitude formation and attitude change are often hard to distinguish. Many of the same processes are at work behind both.

According to the Maastricht Medical Group, attitude development in medical students occurs with opportunity to discuss and become aware of one's attitudes and the factors which change them.[4] Clearly school teaching, peer-groups and conformity pressures are important determinants of attitudes.

The Maastricht Group also emphasises that school program 'should not inculcate those attitudes desired by the Faculty but rather help students to be

aware of their own attitudes and the effect that these have on their management of patients, particularly if the patient's attitudes are in contradiction to their own'.[4]

The affective aspects of medical competence was discussed in a workshop prior to the Annual Conference of the Association for Medical Education (AMEE) in Nijmegen in 1980. The workshop dealt with the problems of helping medical students to be aware of their attitudes towards their patients, as well as learning the requisite knowledge and skills to enable them to be competent medical practitioners.[4,5]

It was generally felt in the workshop that the attitudinal aspect in the field of medical education tends to be neglected.

It was also recognized that medical teachers have little, if any, training in the process of teaching, and even less in awareness of emotional problems of patients, their response to the doctor, and the doctor's own response to pressures from the patient.[4] It was felt that training the teachers was the first step in any attempt to teach medical students about the problems of interpersonal attitudes. In other words, teacher-modelling is essential in the training of doctor/patient relationship.

In the newer medical schools, students are introduced to patients at an earlier stage and are encouraged to holistic approach towards sickness. They become aware of the relevance of emotional components of their patients along with the physical aspects. Students generally welcome early patient-contact, and get encouraged to be more active in the student/patient interaction. This has reversed the traditional situation where the teacher was active whilst the student was passive.

Several studies[5] support the view that 'students in the **early** years of training were more sympathetic, took a more perceptive (even if medically inaccurate) history, and adopted a more caring approach, than those **later** on in their training.

In the Medical School, Universiti Sains Malaysia, the curriculum seeks to integrate attitudinal objectives directed towards:

1. Students and learning
2. Students and patients
3. Students and colleagues
4. Students and the community.

Implementation is spread through-out the five year medical course (and housemanship), because attitudes develop or change slowly over time. Methods like, role playing, problem-solving, team-projects, group activities and case studies are used. There is early exposure to patient situations and discussion as practice, as well as early exposure to group situations, families, and handicapped persons.

Students assume responsibility in group/project leadership, responsibility for the patient during clinical postings, and for individuals, families and communities in the Community and Family Case Study programme.

They get involved in the teaching of peers and others, health education projects and self-help community projects. Students are provided with feedback, recognition, and reward. Teaching of medical ethics and behavioural sciences run parallel with the attitudinal development programme.

ASSESSMENT

It is recognized that 'the instruments to evaluate attitudes and their change are of uncertain validity, and it is felt that the development of awareness of attitudes is much easier in a setting characterized by the holistic approach to medicine. The student does not have an attitude towards an appendix; it is towards the patient, towards the surgeons concerned, etc.'[4]

Attitude assessment by questionnaire is of limited value. Students quickly learn what the faculty expects. Marcotte & Held[2] present a conceptual model for attitude assessment which seems to be realistic. The model is a three-dimensional grid (including psychosocial and physical variables along with the life cycle). It enables the faculty to assess not attitudes but skill or knowledge impairment that may be in part derived from attitudinal bias.

In the Medical School, Universiti Sains Malaysia, attitude assessment is based on:

1. Feedback from peers via group interaction
2. Comments of students after watching video-tapes of interviews with patients
3. Assessment of project/group work via check list and assessor including both verbal and behavioural aspects.
4. Assessment during clinical postings and CFCS activities.
5. Attitudinal assessment built into all examinations, particularly OSCE, MEQ, vivas and clinical.
6. Assessment via multiple choice in problem solving or case studies.
7. Criterion-referenced reports from mentors.
8. Criterion-referenced assessment by selected patients.

For example, student can be checked if he/she

1. Uses open-ended questions and closed questions when appropriate;
2. Listens to the patient, including his concerns and goals, and respects the patients' value system;
3. Handles sensitive issues, like sexual matters or suicidal ideas in a clear, easily understandable manner
4. Takes precautionary measures to avoid non-compliance;

5. Misses the patient's story, and controls the flow of information during interview;
6. Uses jargons or complicated suggestion that result in the patient being confused;
7. Uses language which can shame, embarrass or humiliate the patient;
8. Avoids conflict areas and neglects the patient's concerns;
9. Makes premature reassurances.

CONCLUSION

The medical students must learn to accept that "feeling states" are just as important as scientific data and to integrate both into a total diagnosis.

For effective medical education, the attitudes must be encouraged to develop by clinicians to ensure effective personal development and experience. The personal development must also include ethical issues, and knowledge of and respect for the patient's culture and religious background.

Moreover, the clinicians must be convinced of the value of this approach and must practise it themselves.

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RESEARCH: A METHOD OF ACHIEVING MLT TRAINING OBJECTIVES

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In the planning of the third phase of the Diploma in Medical Laboratory Curriculum it was not foreseen that research could be used as a tool for achieving MLT (Medical Laboratory Technologist) curriculum objectives particularly in the affective and psychomotor domains. The immunology curriculum foresaw only an exposure of diplomats to research during their fourth and fifth years. However, a serendipitous combination of factors such as lack of staff at all levels, especially qualified medical laboratyory technologists trained in immunology, implementation of the third phase of the MLT diploma programme and internal and external pressure to implement research studies resulted in unqualified trainee technologists in their fourth year not only being exposed to research but also being involved in research in our Department out of necessity. After some months we were able to observe that those trainee technologists who were actively involved in research were exhibiting very positive attitudes to their chosen profession, high motivation, a willingness to help even outside their defined duties and normal working hours and to accept responsibility as well, in comparison to those who were not. Furthermore, from the Department's viewpoint we had the advantage of being able to implement new research programmes as well as having research results worthy of publication. This has stimulated further investigation on our part into the reasons for research being an effective tool in the development of various skills and the proposal of an implementation model.

Discussion both with academics and the diplomats themselves suggests that the following factors play an important role in achieving improved psychomotor, affective and cognitive skills in a shorter length of time:

1. The general investigative nature of research itself as well as the joy of discovery.
2. Teamwork.
3. Example set by a strongly motivated academic staff.
4. Problem-based group discussion in the research team.
5. Status of trainee in team: equal membership status but different experience status.
6. Delegation of responsibility.
7. Instant feedback on the importance of accuracy for the whole team.

Group discussion was found to be a very effective step in motivating diplomats to examine themselves to see whether their skills matched the expectations of the group or whether they had to acquire new skills to be able to perform.

Table I shows a model that is suggested as a means of using research to achieve the desired standards in cognitive, affective and psychomotor skills. In this model the steps in the planning of research performed in our Department are correlated to the types of skills which in our experience have shown to be most supported by the discussion and implementation of the relevant step. The blocked in "plus-es" represent areas where the acquisition of new skills can be stimulated either by the group or occur in a self-generating manner, e.g. the use of computers in preparing the report or doing the data analysis, photographic and graphic skills to produce a more effective report. Two of the first diplomats in our Department who were exposed to research in the manner suggested were self-motivated enough as a result of obvious deficiencies within the research teams to choose computers and photography for their respective electives.

Although we lack objective evidence at this stage to support the above, we strongly believe that involvement in and exposure to research improves psychomotor, cognitive and affective skills. In all diplomats who have been involved in research, we have recorded more effective training as well as positive attitudes and improved behavioural patterns.

It is suggested that this model could also be applied to medical students.

Further objective investigation is now required to prove or disprove our subjective feelings on the effectivity of this approach.

TABLE MODEL

RESEARCH STEP	SKILLS		
	COGNITIVE	PSYCHO-MOTOR	AFFECTIVE
Hypothesis	+		+
Objectives	+		+
Design	+		+
Methodology	+	+	+
Ethical			+
Budget	⊞		+
Admin. Plan	⊞		+
Results Analysis	⊞	⊞	+
Report	⊞	⊞	+

TABLE 1. MODEL

TOMORROW'S PHYSICIAN TODAY: A PERSPECTIVE FOR DEVELOPING COUNTRIES

CHAIRMAN:
MOHD. ROSLANI, A.M.

PANEL MEMBERS:

BALASUBRAMANIAM. P.	(*Singapore*)
FRAENKEL, G.R.	(*Australia*)
HARDEN, R.M.	(*Scotland*)
HART, I.R.	(*Canada*)
ZOHAIR NOOMAN	(*Egypt*)

PANEL DISCUSSION

Conference Participants, Colleagues and Students. We are pleased and honoured to have with us today five internationally well-recognized Professionals in Medical Education. They are:

Balasubramaniam, P.	(Singapore)
Fraenkel, G.R.	(Australia)
Harden, R.M.	(Scotland)
Hart, I.R.	(Canada)
Zohair Nooman	(Egypt)

This panel of Professionals will address the subject "Tomorrow's Physician, Today : A Perspective for Developing Countries" : In this context, it is worth while to recall some of the comments of Tan Sri Dr. Khalid Sahan, the Director-General of Health in his opening Keynote Address who stated, **inter alia**, that "a review of medical education must involve an analysis of roles and functions of doctors and their teams in the health system". He also reiterated the need for doctors to be more competent in providing primary health care, to be able to meet society's expectations, to promote self reliance, to work with other professionals and sectors, to involve themselves effectively in community activities, with relevance to local culture and health practices, and to acquire skills and practical experiences in a representative range of health problems encountered in their normal setting.

He also raised the interesting and provocative question, namely "Since medical and health practice is so much culture and context bound, can there be international standards in medical education? These studied comments provide an opportunity and a challenge to Medical Schools in the region to re-assess their activities and their efforts to achieve the goal of "Tomorrow's Physician : Today"

Medical Schools and their staff are responsible for their products, and any short-fall in these products lies within the Schools themselves. It is therefore

essential that the efforts of the School of Medical Sciences, Universiti Sains Malaysia, be directed towards producing a physician who is well-informed about the medical sciences, who is competent and skilled in the techniques of diagnosis, management and rational therapeutics, who has the appropriate attitudes to the preservation of health as well as to the alleviation of illness and diseases, and, at the same time, who is deeply aware of the realistic needs of the individual and the community.

In considering these desiderata, some have put forward the view that graduates should increase their skills and competences to work in the area of Family Practice, and that consideration should be given towards the development of Family Practice as a speciality; while others, are of the opinion that graduates can proceed to enlarge their knowledge and improve their competences and skills in this as well as in other areas through appropriate structured Continuing Medical Education Programmes.

There was general agreement among panel members, as well as the participating audience that doctors, on graduation should be able to promote primary health care and meet the expectations of society, but there was little agreement on the question of how this goal can be achieved. Earlier discussions had indicated that a major objective of the education of medical graduates is to provide them with the skills and competences to promote health, to prevent disease, and to cure and rehabilitate the patient. Professor Fraenkel was of the opinion that graduates would certainly try to do this to the best (of their abilities), but he also made the point that in some countries, and perhaps even in Malaysia, patients' expectations are high. Accordingly they expect to get a complete cure under any circumstances, in as short a time as possible, and that no doctor, regardless of his/her noble efforts and skills could consistently achieve this.

Professor Balasubramaniam of Singapore then indicated that some of these aims could be achieved if the bulk of graduates could be optimally trained, post-graduation, for an additional two years on a rotation basis, spending 6 months in each of the disciplines of Medicine, Surgery, Pediatrics, and Obstetrics and Gynaecology — provided that this can be done without loss of seniority or earnings.

In this context, it is essential to have a clear understanding of the aims of Family Practice or General Medicine Practice in the context of Malaysia's primary health care activities, and also of the roles and functions of the health professionals whose skills and services should be maximally utilized.

The question of whether a National Curriculum could assist us to achieve our goals is of interest.

While a national curriculum would provide a broad basic formula fo all Schools in the country, it would be difficult for such a curriculum to place emphasis on the priorities and problems of **regional needs.** For example the management of tropical diseases is a national need in Malaysia, but regional priorities must be given careful consideration in the prevention, and management for regional types of tropical infections and infestations. As Dr.

Balasubramaniam pointed out "Tropical Medicine deals with health problems and diseases brought about by climatic and environmental conditions that are peculiar to the region. It is therefore our medicine, and we must know it well and practice it well if we are to solve our health problems adequately with the resources at hand." These desiderata and related institutions commitments must go hand in hand with the commitment by the teachers themselves so that Medical Schools promote the teaching of tropical medicine at the undergraduate level. Accordingly, a *Fair curriculum, as suggested by Professor Harden and Hart, with built-in flexibility could provide training in tropical medicine with specific emphasis on the priorities and the needs of the region. The importance of Flexibility was reinforced by the comments of Professor Ian Hart who called attention to the fact that built-in Flexibility exists in the SPICES Model adopted by the School of Medical Sciences, USM. This has permitted the Medical School to make decisions, on how much learning is problem-based, and how much can be done by the traditional method. It also permits the School to decide what degree of integrated teaching will take place and how much community based education can be incorporated into the programme. Flexibility, if properly implemented can also lead to more efficiency in Planning and can provide guidelines to further develop a curriculum that can achieve the School's objective as economically and rapidly as possible. Flexibility is needed to assist graduates to refine their skills, and to enhance their continuing professional improvement by continuing medical education, and also to maintain standards of recognition.

This does not necessarily mean international standards such as the General Medical Council Recognition. These would be difficult and impractical to implement, since Medical Education in the region should be directed primarily to societal needs and priorities, and to the development of a product referred to in the keynote address by Tan Sri Datuk (Dr.) Khalid as "The-Made-For-Malaysia Doctor". Indeed, the Malaysian Medical Council, the Ministry of Health and the Medical Schools are in a position to ensure that graduates perform with high quality ethical professionalism.

In his opening address, Tan Sri Datuk (Dr.) Khalid also called attention to "the objective of medical education in general behavioural terms" stating that at the end of the course, the medical graduate should be able **inter alia** to:

— have an unbiased understanding of his role in the community and to play that role effectively, and

— undertake continuing professional improvement

The Conference has placed understandable emphasis on undergraduate education, and very appropriately so; but there is also a real need to promote Post-Graduate and Continuing Medical Education. These are areas of high priority in the Country, and a valuable contribution in this direction, can be made through the colloborative efforts of Medical Schools.

Professor Harden indicated that the "FAIR" approach mentioned earlier for

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*Fair : F = Flexibility
I = Individualized to regional prioreity problems
A = Activity in the community
R = Relevant

undergraduates studies could also be applied with minor modifications to Post-Graduate and continuing Medical Education. He suggested that Convenience should be included into the process (i.e. FAIR and Convenient) in order to obtain optimal results, since doctors interested in such training may be stationed in different communities, throughout the country, and the method of implementation should be FAIR and CONVENIENT, by means of on-site training in Hospital settings, "distance learning" or both.

At the same time, there is a need to increase the awareness of graduates to the practise of medicine in the community setting, and to the importance of environmental factors in the causation, maintenance and management of disease (illness). In this context, the Community and Family Case Studies (CFCS) is an important component of the School's programme. It is integrated into each Phase of the curriculum throughout the five years of undergraduate education, and provides a service-oriented learning experience through supervised exposure to actual situations in the Community. As Professor Nooman has stated "The movement of community-oriented education is growing and gathering strength..., and the problems of planning and implementation are surmountable". The educational activities that constitute the curriculum in a community-oriented programme is community-based education. The problems and possible solutions to this type of educational process are presented elsewhere in these proceedings by Professor Nooman.

SUMMATION

The discussion and comments which have emerged during this panel discussion have brought compelling attention to the challenge and the problems which we as Medical Educators face trying to achieve the goals of 'Tomorrow's Physician; Today'. To you, my Panel Members, may I therefore express not only my personal thanks as your Chairman but also the appreciation of the audience whose questions and comments reflect the interest that your presentations have generated.

Appreciation also is due to all the Conference Secretariat who behind the scenes have worked with professional competence to prepare, facilitate and harmonise the activities of this meeting — a meeting whose content has reflected clearly the positive demonstration of the interest and assistance by all present to our School of Medical Science, USM and its activities in providing adequate and effective health care services.

With these remarks it is now my duty to terminate this informative and much appreciated panel discussion.